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PROGRAMME DIRECTOR'S ANNUAL REPORT FORM

PROGRAMME DIRECTOR'S ANNUAL REPORT 2010

Programme name: **RURAL ECONOMY AND LAND USE PROGRAMME**

Programme Director: **Philip Lowe, Newcastle University**
Assistant Director: **Jeremy Phillipson, Newcastle University**
Science Communications Manager: **Anne Liddon, Newcastle University**

Reporting period: **from 1 January 2010 to 31 December 2010**

Number of Projects funded under the Programme: **94 projects**

Budget for Programme: **£26,538,635**
(ESRC, NERC, BBSRC, Defra and Scottish Government. Figure excludes additional funding from NERC and 100k from Scottish Gov't for Relu Phase IV)

Total amount of Director's Awards including any supplements: **£2,510,649**

Additional co-funding to projects and Director's Office (2004-2009): **£4,243,272**

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Executive Summary

Most of the remaining Relu projects funded under the second wave of funding on rural land use concluded their work in 2010. The third wave projects on the management of animal and plant disease were at the height of their activity and a new wave of projects was launched on 'Adapting Rural Living and Land Use to Environmental Change' in conjunction with the LWEC programme. Scientific output continues to build and preparations were advanced for a prestigious Theme Issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases'. There were over 130 items recorded during the year in national, local and trade media. During the year the programme has made significant contributions to policy debates, drawing on evidence from across the projects, in such areas as reform of the Common Agricultural Policy, policy for the uplands, targeting of the Water Framework Directive, local government and environmental governance and policy making for the management of animal and plant diseases.

1. Introduction

Aims and objectives of the Programme: The Rural Economy and Land Use Programme (Relu) aims to advance a holistic understanding of the major social, economic, environmental and technological challenges facing rural areas. Its specific objectives are:

- to deliver integrative, interdisciplinary research of high quality that will advance understanding of the social, economic, environmental and technological challenges faced by rural areas and the relationship between them;
- to enhance capabilities for interdisciplinary research on rural issues, between social, environmental and biological sciences;
- to enhance the impact of research on rural policy and practice by involving stakeholders in all stages, including programme development, research and communication of outcomes.

Summary of Key Performance Indicators: A set of KPIs has been agreed for the Director's Office. The broad categories are: scientific quality; interdisciplinarity; user engagement, knowledge transfer and impact; research capacity and training; data collection and management; programme management; and added value (see Section 6).

Start and end dates of phases within the Programme: The reporting period covers projects funded under all four of its main waves of funding.

Number of researcher and related posts: There have been *circa* 500 researcher and related posts in the programme to date in 94 projects (Table 1). The Programme Director's Office comprises: *Director*: Professor Philip Lowe (70% FTE); *Assistant Director*: Jeremy Phillipson (60% FTE); *Communications Manager*: Anne Liddon (100% FTE); Research Associate (40% FTE).

Table 1: Number of projects started before, during and after the reporting period

Type of project	Total awarded	Started Prior to Reporting Period	Started During Reporting Period	Completed Prior to Reporting Period
First Call Seedcorn projects	34	34	0	34
First Call Research Projects	8	8	0	8
Second Call Research Projects	11	11	0	7
Third Call Research Projects	11	11	0	1
Fourth Call Projects	9	0	9	0
Interdisciplinary Fellowships	5	5	0	0
Interdisciplinary PhDs	16	16	0	4

Year of the Programme: Year 7 (2010)

Co-funding and collaboration during the year: The programme is a collaboration between the ESRC, BBSRC and the NERC. It has a budget of £25,268,000, including initial co-funding of £750k from the Scottish Government and £1m from the Department for Environment, Food and Rural Affairs. Additional funding for RELU Phase IV on 'Adapting Rural Living and Land Use to Environmental Change' was also provided by NERC and the Scottish Government.

PLEASE NOTE THAT THE REPORT IS STRUCTURED ACCORDING TO GUIDANCE AND EVALUATION CRITERIA SPECIFIC TO RELU

2. Overview of Year

Most of the remaining Relu projects funded under the second wave of funding on rural land use concluded their work in 2010. The third wave projects on the management of animal and plant disease were at the height of their activity and a new wave of projects was launched on 'Adapting Rural Living and Land Use to Environmental Change' in conjunction with the LWEC programme. Scientific output continues to build and preparations were advanced for a prestigious Theme Issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases'. There were over 130 items recorded during the year in national, local and trade media. Conferences and workshops were convened in collaboration with the Commission for Rural Communities, the Northern Rural Network, the Living with Environmental Change Programme, the EPSRC Sustainable Urban Environment Programme and the Local Government Association.

Delivering Results and Impact

Key strategic findings from projects that came to a close in 2010 relate to projects on land and water use and animal and plant disease. Results from one project throw light on the part that scale plays in realising economic and environmental benefits of organic agriculture. "Green" energy production is explored in another project and it was found that small scale digesters could be economically viable on both arable and dairy farms. The Water Framework poses challenges for farming and Relu research on the implementing this European legislation, modelled the economic implications and potential benefits. Another has provided a comparative overview of international experiences of catchment management. Important new approaches to stakeholder participation in science have been explored in several projects. One team has used catchment management in Loweswater to investigate ways in which communities can take control of environmental problems, and another has involved residents in modelling flood management. The public dimension of animal and plant disease has emerged as an important theme in the third round of Relu projects. Public and stakeholder memories of the Dutch Elm Disease epidemic of the 1970s have proved to be a useful tool in assessing threats from current tree pathogens, while a project exploring zoonotic diseases such as Lyme disease, has been developing a framework for communicating with countryside users to enable them to reduce their own risk of becoming infected.

During the year the programme has made significant contributions to policy debates, drawing on evidence from across the projects, in such areas as reform of the Common Agricultural Policy, policy for the uplands, targeting of the Water Framework Directive, local government and environmental governance and policy making for the management of animal and plant diseases. Eleven Policy and Practice Note and four Briefing Papers were published, including a new series specifically targeted at local authority audiences and advised by Relu's local authority advisory group.

Influencing Land and Water Policy

Relu publications have been carefully targeted to key policy audiences. There were major submissions from across the programme to: the European Commission's consultation on CAP reform; the UK government's consultations on the Natural Environment White Paper and the Water White Paper; and the Select Committee on the Impact of CAP Reform on UK Agriculture. Key responses to Relu's input include: identification of Relu

policy and practice notes as being "particularly relevant to work we are doing in Defra" (Richard Benyon, Minister for Natural Environment and Fisheries); Relu's submission on the Natural Environment White Paper as a "very useful, welcome and timely contribution to the debate" (Natural England); Relu's briefing paper on CAP reform as "a very useful contribution as we go forward with the reform of the CAP post 2013" (European Agriculture Commissioner Dacien Cioloş) and Relu's CAP Briefing Paper "Defra officials have noted this paper with interest and I value Relu's valuable contribution to what will surely be interesting discussions over the coming months and years" (Jim Paice, Minister of State for Agriculture and Food).

Relu Lesson Learning: Fostering Interdisciplinarity and Knowledge Exchange

Interest in learning procedural lessons from the programme on knowledge management and exchange and interdisciplinary research programme management has remained intense. Advice to other programmes was given to LWEC, Global Food Security Programme, Insect Pollinator Initiative, NERC Water Knowledge Exchange programme, NERC Macronutrient Cycles Programme, NERC's QUEST Programme, Scottish Government RERAD's Strategic Research Programme and AHRC. Lesson learning also took place with the NERC Knowledge Exchange Network, the EPSRC Sustainable Environment Programme, Defra, IUCN and the British Veterinary Association. The Director's Office were invited by Sir John Beddington, Government Chief Scientist, to discuss lessons from the Relu Programme. He said: "I do want to emphasise … how impressed I was with the work that you and your team have been doing. You have been able to address what hitherto has been something to which more lip service than content has been addressed. … I really think this is an extremely impressive programme of which you and your colleagues should be proud". Invited addresses by the Director's Office were also given at conferences and institutions in Finland, United States, the Netherlands and for a delegation of rural economists from Beijing. Other invited addresses include to the Government Veterinary Service Conference, the IUCN Peatland Conference, British Cattle Veterinary Association Conference, the Countryside and Community Research Institute Conference, the Aberdeen Centre for Environmental Sustainability and the Macaulay Institute.

UK research funders place increasing emphasis on the need for researchers to implement data management planning to ensure good data practices and increase the potential for data sharing. In 2010 the ESRC and NERC published a new research data policy mandating data management plans as part of all award applications. This follows similar data management planning requirements already in place for the Wellcome Trust, the MRC and the BBSRC. Relu is one of only a few cases where data management plans have been used for many years. Through the increased interest in data management planning driven by funders' requirements, various institutional websites now refer to the Relu data management planning information (e.g. Edinburgh University Library, California University Library, MIT Libraries, Australian National Data Service, Oxford University Library) and Relu is therefore in a unique position to share these experiences. Relu's data management planning experiences were evaluated by Relu-DSS for the period 2005-2010 by assessing the quality of information provided by researchers in a plan; the advice given by Relu-DSS to projects; data management evidence compiled from Relu-DSS liaising with research teams; data archiving results; and PIs experiences regarding Relu's data managing and sharing approach. The review findings (see 3.2) have been shared with wider audiences in a UK Data Archive report on data management

practices[1], through conference presentations[2,3] and on the Relu-DSS website with exemplars of existing Relu data management plans as a resource for the wider research community[4]. Relu data management planning experiences were also shared with the ESRC Policy and Resources Directorate during the development of the new ESRC data policy.

Adapting Rural Living and Land Use to Environmental Change

Relu's fourth and final major wave of funding was allocated and launched at a major event in Manchester. The fourth call was designed in 2009 after a major public consultation. It has drawn in additional funding from the Natural Environment Research Council and Scottish Government, and is a part of the Living with Environmental Change (LWEC) Programme. The new projects push the programme's radical philosophy of knowledge exchange and interdisciplinarity into novel terrain. The theme of the new projects is "Adapting rural living and land use to environmental change". The projects address two overarching objectives. The first is to build networks and capacity for creative knowledge exchange and learning between researchers and policy makers, businesses, practitioners, local communities and the wider public, with a view to strengthening adaptive capacities. The second objective is to explore and promote novel approaches and partnerships for interdisciplinary research and analysis on living with environmental change in rural contexts.

Strategic Influencing – Animal and Plant Disease Management

The year saw continued effort in strategic influencing and in building of a community of interest in the field of animal and plant disease management. The programme has established a core community of 200 key stakeholders, around which in 2010 we targeted a series of publications and a calendar of 10 events. Stakeholder events covered such subjects as the politics of bovine tuberculosis, regulating plant diseases, responsibility and cost sharing, and risk and uncertainty in disease management. Two cross-programme policy briefings were also published on cost and responsibility sharing and Bovine Tuberculosis. Two meetings were held of Relu's national Animal and Plant Disease Forum and there was continuation of a series of internal Defra briefing meetings covering Relu projects. During the year the Relu Director's report on the future role of veterinarians in farming and food production led to significant impact within the profession, including the establishment of a Veterinary Development Council and an inquiry into veterinary specialisation. The Relu Director's Office also began a review, funded by Defra, of the future scope for interdisciplinary research in animal/plant disease management building on Relu's pioneering work in this field.

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[1] Van den Eynden, V. et al. 2010 Data management practices in the social sciences. http://www.data-archive.ac.uk/media/203597/datamanagement_socialsciences.pdf. Colchester, UK Data Archive, University of Essex.

[2] Van den Eynden, V. Data management – engaging researchers and crossing disciplines. Presentation at IASSIST conference 2010, Cornell University, Ithaca, 1-4 June 2010. http://ciser.cornell.edu/IASSIST/program/f2.shtm

[3] Van den Eynden, V. Panellist 'Developing Services to Support Research Data Management and Sharing' panel. European Conference on Research and Advanced Technology for Digital Libraries, Glasgow, 7 Sept 2010. http://www.ecdl2010.org/?page_id=556

[4] http://relu.data-archive.ac.uk/plan.asp

Science highlight 1: Community projects address Loweswater pollution problems

For a number of years now, the Loweswater in the Lake District has been subject to periodically occurring and potentially toxic blue-green algal blooms and a decline in brown trout populations and game anging. A provisional assessment suggests that, in terms of the EU's Water Framework Directive, water quality is only 'moderate' and future management action is necessary to achieve the 'good ecological status' demanded of such water bodies by 2015. The land surrounding the lake is owned by many different landowners and at present consists predominantly of pasture for beef and sheep farming. The farmers took the initiative to form the Loweswater Improvement Project in 2002 with the aim of addressing the problems and the Relu project has used this catchment as a case study in community catchment management. An important part of the project has been to fund small studies carried out by the community themselves to address the problems in a very practical way, helping to pinpoint causes of the pollution and finding a way forward. One such study shows a strong relationship between the timing of nutrient enrichment in Loweswater recorded by palaeoecological methods and changing patterns of land use recorded in historical sources. There is a close association between land use changes in the mid-nineteenth (spread of field drainage, use of lime, intensification of land use) and the mid-twentieth (increase in the acreage of improved grassland, increases in livestock numbers, use of artificial fertilisers) centuries and nutrient enrichment of the lake. Another study shows that domestic septic tanks now play a role in the lake's phosphorous load. Hydromorphological investigations of the streams feeding into and out of the lake have revealed historical variations in the water level. Accumulation of sediment is now causing field drainage problems and this small project has been able to identify possible solutions, by creating wetlands in more appropriate areas, and in other places recommending fencing is recommended to reduce sedimentation.

Science highlight 2: European Single Market could threaten plants and trees

A reconstruction of the biology, policy and economics of the Dutch Elm Disease outbreak of the 1970s found that biology trumped policy at an early point in the outbreak and that there are important lessons to be learnt for current and future disease threats. In the case of Dutch Elm Disease action taken was too little too late, but in any event, prevention would have been better than any attempted cure. Earlier and more aggressive sanitation felling would not have slowed the disease spread to any significant extent but port inspections and quarantining of diseased timber might have prevented establishment of the disease in the first place. This is particularly relevant when considering the 'sudden oak death' pathogen now affecting trees, woodland and heathland in the UK. It is thought to have entered the UK through the nursery trade and affects a widening range of hosts. Although the plant health authorities in the UK appear to have acted with reasonable speed to attempt to contain the outbreak these measures, and the considerable efforts made to bring garden owners, landowners and other stakeholders on board, have had limited success. This is due both to the complexity of the disease and its unpredictable and shifting host range but also due to resistance from some large garden owners and others to the removal of diseased material. The researchers conclude that the cardinal lesson to be drawn from both outbreaks is the same – it is far better to prevent the entry of a disease than to attempt to contain it once established. But the Sudden Oak Death outbreak also illustrates how hard this principle is to implement in a European Single Market. Moreover, the research suggests a surprisingly low level of awareness or understanding of the tree disease threat, which translates into a comparatively low willingness to pay for control measures. Public awareness needs to be raised, both in

order to establish a stronger sense of personal responsibility for preventing tree disease spread (as gardeners, landowners and visitors to the countryside), but also to elicit more support and a greater willingness to pay for any more restrictive measures and policies that may in future be necessary. Equally, key stakeholders need to learn from history and be more aware of other country experience in their assessment of the threat from invasive pathogens. Environmental agencies and environmental groups need to give more attention in their campaigning and advocacy work to the threat to biodiversity, our horticultural heritage and other public goods from invasive diseases than they do currently and experts need to develop a better and more critical understanding of the interlinked biology, economics and policy of biosecurity measures and of the difficult trade-offs that will need to be made between freer trade and effective biosecurity.

Dissemination highlight: Relu impacts on future of veterinary profession

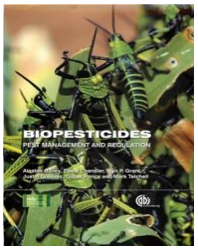
In 2009 the Relu Director Philip Lowe chaired the Vets and Vet Services Working Group for the government and the veterinary profession, and subsequently published the influential report "Unlocking potential: A report on veterinary expertise in food animal production", which examines the changing role of rural vets. The report drew on research and evidence from within the Relu programme and has had a major impact on veterinary policy and the organisation of the veterinary profession, including in 2010 the establishment of the Veterinary Development Council, and a review of the purpose and function of veterinary specialisation by the Royal College of Veterinary Surgeons.

3. Capacity Building and the Research Environment

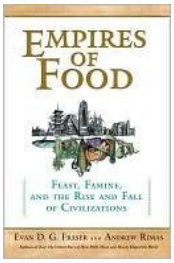
3.1 Scientific Output

123 presentations and papers were given by Relu researchers at conferences and workshops and at least 43 journal articles were published in 2010 by ongoing projects[5] (Annex B). Most of this work is appearing in high status disciplinary journals, and includes a number of articles addressing Relu's interdisciplinary research practices and perspectives.

At the programme level we continued to concentrate on drawing together interdisciplinary special issues of high impact disciplinary journals devoted to synthesised findings from Relu. During the year we succeeded in securing agreement for a Theme Issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases' and embarked on preparation of the papers. The issue is being edited by Philip Lowe, Jeremy Phillipson, Laura Green, Stephen Hunter, Mike Jeger, Guy Poppy and Jeff Waage. The theme issue will deal with the growing threat of infectious diseases and their manifold consequences. Using interdisciplinary approaches, the papers consider new framings of problems such as risk communication, disease management, and predicting future outbreaks. By bringing together the natural and social sciences, the authors explore infectious diseases in the wider context of social concerns, economic impacts and regulatory frameworks.



2010 saw the publication of two influential books by Relu researchers, one a path breaking scientific monograph; the other a panoramic popularisation. *Biopesticides: Pest Management and Regulation* published by CABI (edited by A Bailey, D. Chandler, W.P. Grant, J. Greaves, G. Prince and M. Tatchell). Chemical pesticide methods are becoming less readily available due to increasing resistance problems and the prohibition of some substances. The book addresses the challenges of developing and promoting biopesticides instead. It provides internationally comparative analyses on the registration of biopesticides and considers options for future biopesticide practices.



In *Empires of Food: Feast, Famine and the Rise and fall of Civilisation*, published by Random House Relu Interdisciplinary Fellow Evan Fraser and journalist Andrew Rimas explore the innumerable ways that food has changed the course of history.

During the year the programme also supported two further cross-programme publication ventures which are underway: a special journal issue on expert systems in *Environmental Modelling and Software* and a major book on catchment management to be published by Earthscan.

[5] The breakdown of ESRC's Research Catalogue means that we are unable to report fully on journal articles produced by all Relu projects in 2010.

3.2 Interdisciplinary Reach

Interdisciplinarity isn't a luxury in a time of financial austerity, but a *sine qua non*. Technical developments won't provide all the answers on their own. By integrating social and natural sciences, Relu has introduced new outlooks on innovation, that emphasise coupled socio-technical change rather than narrow technological outcomes. Relu has also been a radical experiment in project and programme management and capacity building for interdisciplinarity. 40 disciplines are represented in the Programme, with every project including natural and social scientists. During the year Relu's experience of interdisciplinary working and cross-council collaboration has been drawn upon by various research funders and Research Council programmes and Relu's interdisciplinary approach has also been promoted internationally (see 3.7).

A workshop took place in October in conjunction with the EPSRC Sustainable Urban Environments (SUE) Programme, chaired by LWEC Director Andrew Watkinson. The workshop focussed on lesson learning between research programmes on interdisciplinary programme management and research practices and stakeholder engagement. Regarding efforts to integrate the approaches of separate macroscience communities (e.g. between the social, physical, environmental or biological sciences), there seems to be (at least) two distinct models in operation: an intra-council model embodied in the SUE Programme; and an inter-council model embodied in Relu. SUE (set up in 2006) is very much a successor to the EPSRC's Towards the Sustainable City Programme. Besides engineering and physical sciences, these successive programmes, although almost wholly financed by the EPSRC, have funded research collaborations involving a range of social and environmental sciences. The social science that is supported as part of collaborative consortia under such programmes tends to be of an instrumental nature, aiding the solving of engineering problems with an emphasis on research that is methodologically focused and rigorous. Relu presents a contrasting model based in the joint funding of interdisciplinary research by its three research councils. From the start of the programme there was a commitment to pool the funding, but also, crucially, the funding decision making. This sharing of authority required specific governance arrangements, including the establishment of a strategic advisory committee, with senior scientists nominated by each of the three research councils (plus representatives of major stakeholders), to oversee the direction of the programme; and a programme management group, with senior officers of the three councils, to steer the administration of the programme. To operationalise a pooled funding pot additionally necessitated bespoke cross-council procedures for grant applications and assessment. Then, in order to stimulate interdisciplinary working and integrated outcomes, there were further developments in programme management, including the appointment of an independent programme director to coordinate the research and internal and external communication activities; the provision of specific seed-corn funding mechanisms to support the building of novel interdisciplinary partnerships; and the establishment of a cross-council data support service (the first of its kind). These institutional innovations and procedural improvisations hybridised the processes and cultures of the three research councils and absorbed lessons from previous inter-council collaborations.

Relu researchers also continue to take the programme's interdisciplinary insights and outlook into strategic positions in research and practice: Gareth Edwards-Jones, appointed to the Waitrose Chair in Sustainable Agriculture at Aberystwyth; Relu Director

Philip Lowe appointed to the Board of the Newcastle Institute for Research on Sustainability; Peter Mills appointed as Vice-Principal at Harper Adams University College; Stuart Lane appointed to a Chair at the University of Lausanne in Switzerland; and Klaus Hubacek appointed to a Chair at the University of Maryland, developing a new research centre on the 'Human Dimensions of Global Change'. Relu stakeholder forum members are also moving into key positions: David Gregory has joined the BBSRC Council and the Assured Food Standards Board; Tamsin Cooper has taken up a post as Deputy Director at Green Alliance; Helen Browning has been appointed as the new director of the Soil Association; and Tony Hams has been appointed a member of the Natural Environment White Paper Ministerial Advisory Panel. Relu researchers continued to play a key role in the interdisciplinary UK National Ecosystem Assessment (NEA).

Finally, there is also evidence that researchers are using the interdisciplinary research capacity they have built within Relu within new Research Council projects. For example, Norval Strachan and Ken Forbes (*Reducing E coli Risk in Rural Communities*) at Aberdeen have for example been awarded an Environmental and Social Ecology of Infectious Diseases catalyst network grant on gastrointestinal pathogens in the environment – a joint initiative between the MRC, NERC, ESRC and BBSRC as part of the LWEC programme. It involves a number of the existing Relu E. coli partners as well as other academics, government researchers and stakeholders. The new project builds on the Relu work as it will be linking natural and social science under the umbrellas of environmental change, food security and ongoing changes in agriculture. Ian Bateman and colleagues have also begun an ESRC Large Grant, *Social and Environmental Economic Research into Multi-Objective Land Use Decision Making*, which seeks to put the ecosystem services approach to decision analysis into practice.

3.3 Programme Wide Events and Networking

Programme-wide events organised by the Director's Office included the launch conference *Adapting Rural Living and Land Use to Environmental Change* (July) (see 4.2), a workshop on *Strategic Land Use: Crossing the Urban Rural Divide: A Relu/SUE Workshop* (October) (see 4.2), and two meetings of stakeholder forums (see 4.3).

3.4 Research Capacity and Training

One of Relu's primary objectives is to enhance and expand capabilities for integrative, interdisciplinary research on rural issues between the social, biological and environmental science communities. Relu projects offer fertile ground for hands-on research training for research staff and the programme's 14 PhD students, of whom 4 completed prior to reporting period and 2 completed during 2010 (Anders Munk and Dugald Tinch). Relu PhD students are successfully securing new positions following their research. Alan Poots who was a PhD student with Relu's *Implications of a Nutrition Driven Food Policy for the Countryside* graduated and secured employment for the South West Tourist Board. Gareth Clay who was a PhD student on the *Sustainable Uplands: Learning to Manage Future Change project* is now working as a post-doc in the Department of Earth Sciences at University of Durham. Dugald Tinch, PhD student on the *Sustainability of Hill Farming* project is embarking on a 5-year post doc at Stirling on valuing marine and coastal ecosystems. Steve Emery who gained his PhD on farmers' values and upland

change is working as a post-doc at Newcastle University on a Call IV Relu project. Anders Munk was appointed Assistant Professor, Department for Engineering Management, Technical University of Denmark.

There are also 5 Relu Interdisciplinary Early Career Fellows. The aim of the fellowship scheme is to support outstanding early career researchers interested in pursuing interdisciplinary research and careers, and at the same time to foster the development of interdisciplinary research capacity in selected priority areas. Two interdisciplinary fellows completed their research in 2010. Althea Davies has now moved to the Macaulay Land Use Research Institute (Aberdeen) to join a Relu Knowledge Exchange project on collaborative land management. Evan Fraser has taken up a position at the Department of Geography, University of Guelph, Canada.

For rural development policy makers and practitioners Relu co-organised and sponsored a short course on CAP reform involving 45 delegates in collaboration with the Northern Rural Network. The course attracted stakeholders from across the public, private and third sectors and involved a number of prominent experts including Prof Allan Buckwell, Country Land and Business Association; Elena Saraceno, Bureau of European Policy Advisers; Prof John Goddard, Foresight expert panel; and Alastair Johnson, from Defra.

3.5 Data Collection and Management

A main achievement for the Relu Data Support Service (Relu-DSS) during 2010 was the linked data archiving across the UK Data Archive (UKDA) and the Environmental Information Data Centre (EIDC) of the Centre for Ecology and Hydrology (CEH). After a joint Relu data licensing agreement was agreed and signed between UKDA and CEH, and CEH launched its new Information Gateway (https://gateway.ceh.ac.uk/) in September 2010, Relu-DSS progressed in creating metadata records for Relu projects for the CEH Gateway and transferring ecological and environmental data collections to EIDC. All other data are archived at UKDA. All archived data for the Relu programme can be easily accessed via the Relu Knowledge Portal (http://relu.data-archive.ac.uk/datasets.asp) or directly in the ESDS data catalogue (http://www.esds.ac.uk/Lucene/Search.aspx) and the CEH Information Gateway. Links between data records at UKDA and EIDC ensure that users know that complementary data from individual projects are available across two data centres. Data for 19 projects have been archived so far; six of which have data at EIDC.

The Relu Knowledge Portal currently contains 200 data records for archived data and data under development (for ongoing projects). The portal also has over 800 research output records for past and present Relu projects and over 100 Relu programme outputs. Outputs are harvested weekly from the ESRC Research Catalogue through an Open Archives Initiative Metadata Harvesting Protocol (OAI-MHP).

During 2010, Relu-DSS met with the UK Environmental Observation Framework (UK-EOF) to contribute Relu data resources and experiences to the UK-EOF environmental observation data catalogue, in view of UK-EOF's intent to include environmental socio-economic observations in the data resources and activities catalogue.

Relu-DSS has continued to provide data management and sharing support to all Relu projects. This topic was discussed with all Call 4 PIs at the launch event for the knowledge exchange projects. The Data Management Plan form was revised for their use, with better guidance provided in the form and more emphasis placed on the importance for researchers to gain consent for data archiving of qualitative data and to explore solutions to enable the archiving and sharing of confidential data. Data management plans of eight Call 4 Relu projects have recently been reviewed by Relu-DSS.

Three training workshops on data managing and sharing were held with colleagues of the UK Data Archive during 2010 in Colchester, Leeds and Cardiff. Six Call 3 projects were visited during 2010 to discuss data management and sharing needs and provide advice. Data management guidance on the Relu-DSS website was improved, with a data management checklist added. A third edition of the Managing and Sharing Data – Best Practice Guide is being prepared as a joint UKDA/Relu publication, which will include additional research centre and programme-level data management planning guidance.

A review of Relu's data management planning experiences by Relu-DSS for the period 2005-2010 found that:

- data management plans need to contain clear and practical information and be relevant
- support services need to give clear and specific advice that researchers understand (not in 'data archiving' jargon)
- a pro-active and individualistic approach by data support services in providing data management information to researchers helps to ensure that researchers are well informed, that data management plans are well developed and that data sharing limitations are avoided
- researchers value opportunities to discuss data management issues face-to-face with support services
- researchers may under-estimate difficulties to share data, especially for confidential, commercial or sensitive data, and fail to gain consent for data sharing due to being unaware of the importance of discussing data sharing early in research during consent procedures, thereby jeopardising the ability to share research data
- preparing a data management plan does not mean that data management is put into practice; research funders mandating data management planning need to consider how to ensure that planned data management practices are indeed implemented, e.g. encouraging reporting on data management practices when reporting research progress
- researchers may struggle to find time to implement data management practices, especially in the later stage of a research project.
- mandating data archiving has a role to play, as very few researchers would voluntarily make data available for archiving or implement relevant data management practices; the Relu data policy alongside strong encouragement by the programme director meant researchers had to implement data management strategies
- Relu shows that a combination of a data policy, well-established data sharing infrastructures (UK Data Archive and EIDC), data support for researchers and active support of programme directors, results in increased availability of research data to the research community beyond the primary research groups.

In the UK Relu-DSS impacts widely on data management and sharing. Both Louise Corti and Veerle Van den Eynden were invited by JISC to peer-review project proposals for the JISC's Managing Research Data programme. They also manage a project within this programme, awarded to the UK Data Archive, that develops research data management planning strategies for ESRC research centres and programmes[6].

The Relu-DSS manager was invited to present on 'Sharing and managing sensitive data in research with people at the 4th DCC / RIN Research Data Management Forum, Manchester, 11-12 March 2010[7]. Further afield, the Relu-DSS manager was invited by the Human Sciences Research Council in South Africa to lead a data management workshop for their researcher community at the Centre for High Performance Computing national meeting[8].

Monitoring internet traffic to the Relu-DSS website (April 2009 - Nov 2010) with Google Analytics shows that the website is used frequently: 9000 visitors spending on average 2 minutes on the site. The most visited pages are:

- Relu data resources portal (72% of visits) – a portal to find research data and data providers for Relu-related topics (http://relu.data-archive.ac.uk/dataresources.asp); most traffic is directed here via Google
- Relu Knowledge Portal (7.2 % of visits)
- Relu data management plan (6.5 % of visits).

3.6 Programme Management

Programme management and project oversight
Project Communication and Data Management Plans provide a basis for quality assurance within the Programme. Eight Call IV project plans have been reviewed and signed off by the Director's Office and Relu Data Support Service.

A group planning meeting was held in Manchester with researchers and Principal Investigators from 9 Relu projects funded under the fourth call. In addition, meetings were conducted with 3 projects at which inter-project links and synergies were discussed. Seven cross-project activities were also supported by the programme (Section 3.7).

Advisory committee meetings
The Strategic Advisory Committee met once and the Director's Office provided briefing, advice and background analysis on the following themes: Communications Plan 2010-2012; Adapting Rural Living and Land Use to Environmental Change: Relu/LWEC joint projects; and Relu's approach to Fostering Interdisciplinarity and Knowledge Exchange**.** Three meetings of Relu's newly established Local Authority Sounding Board also took place.

Assessment and commissioning activity
During the year the Director's Office contributed programme-fit assessments for the applications under the joint Relu-LWEC call on *Adapting Rural Living and Land Use to*

[6] Data Management Planning for ESRC research data-rich investments http://www.data-archive.ac.uk/create-manage/projects/jisc-dmp
[7] http://www.dcc.ac.uk/events/research-data-management-forum/rdmf4-dealing-sensitive-data
[8] http://www.chpcconf.co.za/index.cfm?x=home

Environmental Change. The selection of projects took place in April 2010. Some 27 proposals were assessed and 9 awarded.

3.7 Added Value

Promoting synergy between research projects
As well as programme-wide events (see Sections 4.2 and 4.3) and group planning meetings (Section 3.6), there was active encouragement of inter-project synergies. Facilitation of inter-project linkages continues to lead to added value, including published outputs and cross programme briefing papers, policy submissions and policy notes (see 3.1 and 4.1). There have been numerous joint articles. Eight other cross-project activities were sponsored by the Programme during the year:

- Relu sponsored seminar for Scottish policy advisers *Delivering Ecosystem Services Through Agricultural Payments*, Pentland House, Edinburgh, involving two Relu projects.
- Relu sponsored workshop in June on the *Benefits of Social Interaction Around Models* at the University of Edinburgh. Researchers from four projects met to share their experiences of the use of models with stakeholders, knowledge of model research, and discuss the sometimes 'hidden' benefits of the social interaction model use generates. Along with substantial consideration of the definition and process of modelling, and the extent of social interaction it generated, the key themes to emerge from the workshop covered, (i) the practicalities and processes of engaging stakeholders, (ii) the social context in which models are used, and (iii) the political context in which model are used with stakeholders.
- Relu workshop in October on *Cost and Responsibility Sharing in Disease Management* at University of Warwick and involving two Relu projects. Attendees included members of Defra's responsibility and cost sharing team, the NFU and the Horticultural Trades Association. The workshop informed the Defra industry Advisory Group report on detailed proposals for cost sharing policy.
- A Relu workshop in November on *Risk and Uncertainty in the Context of Animal and Zoonotic Disease Management* involving three Relu funded projects. Held over two days, the workshop explored the relevance of findings from the projects and potential future applications. The first day included sessions on Decision-Making Frameworks, Risk Perception and Communication and a European perspective presented by Prof. Ekdahl from the European Centre for Disease Prevention and Control. The second day looked at Identifying Uncertainty, and Policy Relevance and Priorities for Future Research. Stakeholder attendees came from Defra, ADAS, Veterinary Laboratories Agency, NFU Scotland, Health Protection Agency, United Utilities, Royal Parks Richmond, Forestry Commission, Public Health Wales, Natural England, Food Standards Agency and the Scottish Executive.
- A Relu sponsored series of briefing meetings for policy makers Defra (see 4.5).
- Sponsorship of a major book on biopesticides, involving two Relu projects (see 3.1).
- The programme is also supporting two further publication ventures: a special journal issue on expert systems in *Environmental Modelling and Software* and a major book on catchment management to be published by Earthscan.

There were numerous other informal and bilateral project synergies in 2009. Examples include:

- Joint publications on river pollution and land management scenarios (RES 227-25-0024 and RES 224-25-073), disease cost and responsibility sharing (RES-229-25-0013 and RES-229-25-0016) and the management of Bovine Tuberculosis (RES-229-25-0016 and RES-229-27-0007-A).
- Joint conferences, publications and data exchange on catchment management (RES-229-25-0009, RES-229-25-0008, RES 227-25-0001 and RES 227-25-0024).
- Joint meetings and informal exchanges on stakeholder engagement and knowledge exchange practices (RES-240-25-0012 and RES-229-25-0025) and exchange of public engagement methodologies (RES-227-25-0018 and RES-229-25-0008).

Making international connections

The Director's Office has sought to help Relu projects make appropriate international connections:

- Invited addresses were given by the Director's Office at conferences and institutions in Finland (Kirkkonummi, Espoo), United States (Cornell and Penn State Universities) and the Netherlands (Wageningen) on the experience of the porgrammme around the theme "Why Social Scientists Should Engage with Natural Scientists' and for a delegation of rural economists from Beijing.
- Relu's interdisciplinary approach has also been promoted internationally. For example, Joe Morris from the Relu *Integrated Management of Floodplains* team contributed to the Second International Conference on Drought Management, sponsored by the Food and Agriculture Organisation of the UN in Istanbul, concentrating on the economics of drought. Sarah Randolph from the Relu Assessing and Communicating Animal Disease Risks for Countryside Users project presented at a special Relu session at the Emerging Vector-borne Diseases in a Changing European Environment project in May 2010 at Le Corum, Montpellier.
- Membership by the Relu Director on the UK China Sustainable Agriculture Innovation Network (SAIN**)** Advisory Board.

Influencing Research Council policy and practice

The Relu Programme is a conduit for learning between the Research Councils and other research funders. Highlights from the year include:

- The Director's Office was invited to brief the Government Chief Scientist on its approach to interdisciplinary programme management and knowledge exchange
- Director's Office briefings were given to other Research Councils and programmes including LWEC, Global Food Security Programme, Insect Pollinator Initiative, NERC Water Knowledge Exchange programme, NERC Macronutrient Cycles Programme, NERC's QUEST Programme and AHRC.
- A joint workshop was held with the EPSRC Sustainable Environment Programme (see 4.2).
- Relu jointly launched a new wave of funding with the Living with Environmental Change (LWEC) programme, with an objective being to demonstrate how the LWEC Programme might meet some of its major challenges regarding interdisciplinary working, stakeholder engagement and knowledge exchange. Ken O'Callaghan, LWEC Head of Directorate, said that *"LWEC has learned from Relu that focussing on the aims of research with stakeholders from the outset shifts emphasis away from discrete scientific disciplines and onto the problems that the research aims to solve.*

... Relu's publications [have] *influenced discussions elsewhere in LWEC on the subject of what knowledge products we need to produce to promote impact and an interdisciplnary culture". … "Relu's innovative workshops have influenced the approaches taken in meetings for the develoment of other LWEC programmes and have helped the LWEC Directorate to be more creative in setting up opportunities for knowledge flow between academics and funders".*

- Lesson learning also took place through the NERC Knowledge Exchange Network. Faith Culshaw at NERC described how the council *"uses Relu as an example of good practice in user engagement and knowledge exchange, in it's own KE policy* [and advice] *it supplies to all new research programmes ... Also, in meetings with new research programme directors and others developing KE plans, in policy-relevant programmes, NERC highlights Relu good practice in publishing briefings particularly targeted at policymakers. ... ... Building on the success of Relu's workshadow scheme, NERC also now offers a workshadow option - a more bottom-up approach whereby the researcher makes their own workshadowing arrangement ... through which we have supported some very successful placements."*
- A meeting was held during the year with the head of knowledge exchange at ESRC, to consider how best the experience of knowledge exchange within the Relu programme might be built upon within the councils' impact tool kit. Fiona Armstrong, ESRC Head of Knowledge Transfer explained: *"ESRC does in fact consider Relu to be a source of good practice* [and] *it will be used to highlight the innovative ways in which Knowledge Exchange and Comms tools can be used to develop and deliver a pathway to impact. ...* [Relu's] *practical experience, both in terms of thinking about potential pathways and then implementing them, will I am sure inspire other researchers who might be otherwise daunted".*
- The Natural Environment Research Council published a scoping study on the Valuation of Natural Resources. The report notes numerous references to Relu and says that during interviews with leading researchers "The Relu programme was referred to as an exemplar that demonstrated success in the integration of the sciences in ways that appealed to a range of stakeholders including policymakers."
- Relu's workshadowing and visiting fellowships schemes featured in a review of the role of Placement Fellowships in knowledge exchange between academe and public sector policymakers. The review was undertaken by the Living with Environmental Change (LWEC) programme and the University of Edinburgh.
- Relu researchers are leading a new interdisciplinary network for valuing biodiversity, ecosystem services and natural resource use, sponsored by NERC under the LWEC programme. The network principal investigator is Ian Bateman from the Relu project *Modelling the Impact of the Water Framework Directive.*
- Relu's experience in cross-council data management and support continued to drive research council innovation in data management and archiving (see 3.5).
- Relu is influencing wider research council perspectives on cross council and interdisciplinary research programme management:

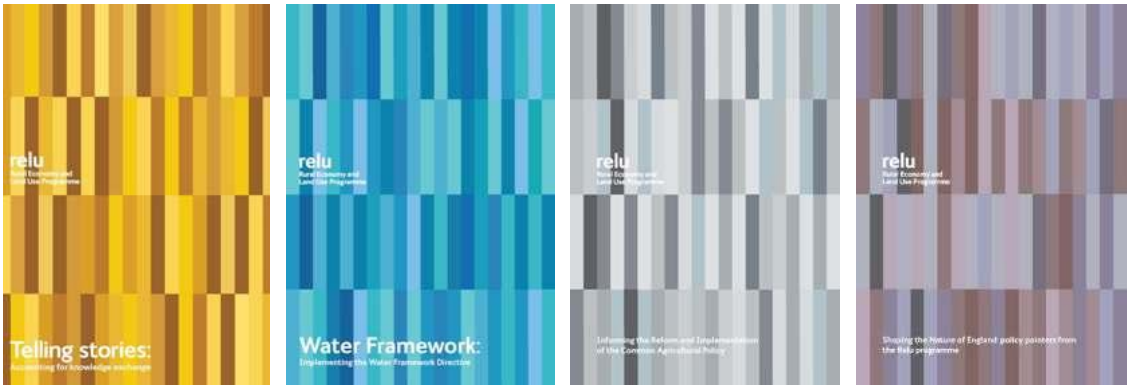
3.8 Key Items of Expenditure

Key items of expenditure include: £11k on sponsoring synergies between research projects; £2.1k on attending Research Council meetings; and £1.3k on project visits and planning meetings; and £4k on the *Strategic Land Use: Crossing the Urban Rural Divide* Relu/SUE Workshop.

4. External Communication

4.1 Programme Level Publications

In 2010 Relu published 4 Programme-level briefing documents (nos. 10-13) and 11 Policy and Practice Notes (nos. 14-24) drawing out the main highlights of project's findings. These were distributed to approximately 2100 stakeholders on the Relu mailing list including Civil Servants, think tanks, academics, NGOs, politicians and commercial and professional interests, as well as being available electronically. Four newsletters were also prepared and distributed to the Relu mailbase. Relu publications complement other activities which include stakeholder involvement throughout the research at programme and project level, targeted seminars for key interest groups and organisations and use of mainstream, professional and trade media.



Briefing Paper No 10 *Telling Stories: Accounting for Knowledge Exchange*, reports on Relu's approach to impact analysis which has been widely promoted across the Research Councils and beyond. Relu is attempting to capture both the shorter and longer term effects of knowledge exchange through its Stakeholder Impact Analysis Matrix, or SIAM. We know that several thousand stakeholders are engaged with the Relu research projects and these include policy makers, practitioners, businesses and voluntary organisations. The aim of SIAM is to track their involvement in the research, to see what they bring to it and what they take away. Sir John Beddington said of the Briefing Paper: "knowledge exchange and the translation of research into use are also issues that I consider important. … I chair the Food Research Partnership which currently has a sub-group looking at translation issues in certain sectors. … 'Telling Stories' looks to be of particular relevance to their work".

The Policy and Practice Note series continued to expand at a rapid rate, with nos. 14-24 appearing during the year:

14 Sustainable uplands: reshaping land use policy for our hills
15 Integrated management of floodplains
16 Policy-making for animal and plant disease: a changing landscape?
17 Sustainable uplands: learning to manage future change
18 Collaborative frameworks in land management: A case study on integrated deer management
19 Bovine Tuberculosis: a problem for farmers, conservationists and policymakers
20 The changing role of local government in managing water resources
21 Angling in the rural environment
22 Models, decision-making and flood risk: doing simulation modelling differently
23 Is wildlife conservation compatible with arable farming? Evaluating the options for sustainable agriculture
24 The Big Society: helping communities take action

Three of the notes drew on research across groups of projects: Policy-making for animal and plant disease: a changing landscape?; Bovine Tuberculosis: a problem for farmers, conservationists and policymakers; and The changing role of local government in managing water resources. The latter was the first of a new series specifically targeted at local authority audiences and advised by Relu's local authority advisory group. One local authority described the note as "most informative, and highly relevant to our own work in trying to develop opportunities to build partnerships and find novel ways of working to minimise flood risks".

During the year the Policy and Practice Notes became especially pivotal in enabling the programme to efficiently draw together submissions from across the programme of synthesised and cross cutting policy implications for various public policy consultations (including the European Commission's consultation on CAP reform, and UK government consultations on the Natural Environment White Paper and Water White Paper, and the Select Committee on the Impact of CAP Reform on UK Agriculture). They were used in the production of three policy relevant programme wide briefing papers.

No 11 Water Framework: Implementing the Water Framework Directive
No 12 Informing the Reform and Implementation of the Common Agricultural Policy
No 13 Shaping the Nature of England: policy pointers from the Relu programme

Relu publications continue to receive positive feedback and are contributing to the development of policy (see section 2).

Research and viewpoint articles from the Relu programme have continued to feature in local, regional, national and specialist press. This year, in addition to the farming media, there has been coverage in specialist journals such as "The Veterinary Record", "Angling Times", "Town and Country Planning", "The Ecologist" and even "Mother and Baby". Relu news items are regularly featured in the Royal Agricultural Society and Royal Town Planning Institute electronic news briefings. Researchers have also appeared several times on BBC Radio and tv in science and environment programmes, including "Costing the Earth" and "Countryfile".

While work shadowing with the National Farmers' Union, the Science Communications Manager had the opportunity to attend the NFU conference and write articles for their website about it, as well as blogging on Relu's own website. The blog has now become a permanent feature of the site.

A Relu Theme Issue of *Philosophical Transactions of the Royal Society B* was also edited during the year (see Section 3.1).

4.2 Significant Engagement Events

Adapting Rural Living and Land Use to Environmental Change: Manchester Conference Centre, 1st July, 2010
The launch conference for the 4th wave of research projects was intended to strengthen and develop links between researchers and stakeholders. The day was attended by 22 researchers, 17 of the projects' existing stakeholder partners, and 45 other key stakeholders from the private, public and third sectors. Many of the latter group had taken part in the consultation over the scope of the Call IV research specification. The day was chaired by Les Firbank (North Wyke Research) and included presentations by Ken O'Callaghan (LWEC Directorate) on the rural adaptation challenge, Philip Lowe (Relu Director) on the focus of the new wave of projects, Claire Waterton (Lancaster University) on the meaning of adaptation, and Kathryn Monk (Welsh Assembly Government) on stakeholder engagement in Relu.

A central part of the programme consisted of three 'stakeholder-research dating' sessions. These 'dating' sessions sought to engage potential stakeholders with the current Relu projects. Each delegate attended three "dating sessions" which had been arranged prior to

the conference. These were designed to allow attendees to discover a little about each of the three projects, facilitate discussion and to provide an opportunity for stakeholders to comment on the research. The sessions allowed prospective stakeholders the chance to express tangible commitment to engage in the projects. Stakeholders had 'sign up booklets' and filled in 'commitment slips' which were passed to the organisers, who subsequently analysed and fed these back to research teams for follow up action. Following the 'dating' sessions there was an opportunity for those who had attended the conference, as well as project stakeholders, to feed back into the direction and mechanisms of the Relu programme as a whole.

97% rated the quality and value of the conference as good or excellent, with most pointing to the networking session format as the highlight. The stakeholder sign up slips were a significant success. In all 150 were returned by stakeholders during the day. There were 145 expressions of interest in wanting to be kept informed by specific projects, 49 expressions of willingness to give further advice to projects, 31 offers of additional resources, and multiple expressions of interest to host Relu researchers on work shadowing or for stakeholders themselves to become visiting fellows to the projects. Following the workshop 12 new visiting fellows have been brokered and signed up to the call IV projects (see 4.4).

Strategic Land Use: Crossing the Urban Rural Divide: A Relu/SUE Workshop, 27th October, London

As part of efforts, on the one hand, to link the Relu research community and its interdisciplinary research capacity into new research initiatives, and on the other, to learn from and pass on process lessons from the programme, Relu initiated interactions with EPSRC's £46m Sustainable Urban Environment (SUE) Programme (see 3.2). A joint-workshop was therefore held between Relu/LWEC and SUE in order to explore lesson learning between the programmes on interdisciplinary programme management, interdisciplinary research practices and stakeholder engagement. The workshop was also a basis for developing new scientific agendas for strategic/joined up approach to land use, crossing the urban and rural divide, and to build links for future research. The programmes found they had a lot in common. Researchers from both the programmes were there and there was some valuable networking in an extended lunchtime poster session. Connections were made and foundations laid for further exchanges of information and expertise.

4.3 Programme-Level Meetings with Potential Research Users

Relu is committed to engaging stakeholders throughout the research process. This requires a new philosophy of *knowledge exchange*, not just knowledge transfer, and the sharing of knowledge between researchers and a wide range of policy makers, practitioners, businesses and other publics. The programme has built extensive soft networks for knowledge exchange.

Figure 3 records the formal involvement of over 200 different stakeholder organisations at the programme level during 2010. 15 bilateral meetings were also held between the Directors' Office and key stakeholders, including One North East Regional Development Agency, Defra, Environment Agency, Northumberland County Council, East Riding of Yorkshire Council, Lincolnshire County Council, Commission for Rural Communities

and the Veterinary Public Health Association (see Annex A). Two meetings were held of Relu's Local Authorities advisory group.

Relu is advised by a Strategic Advisory Committee (SAC), chaired by Sir Howard Newby, which includes representatives from Defra, Countryside Council for Wales, Scottish Government and the Joint Nature Conservation Committee. The Director of the programme has also been a member of Defra's Science Advisory Council, has chaired the Vets and Veterinary Services Working Group, and is a member of Natural England's Science Advisory Committee.

Since its inception, Relu has also engaged with stakeholders via several thematic forums. The forums are used as sounding boards on research programme and project development. They include key stakeholders from the public, private and voluntary sectors who can represent their organisations and also act as conduits for knowledge transfer. During 2010 we held two meetings of the Animal and Plant Disease Forum. Membership includes: Jeremy Blackburn, Commission for Rural Communities; David Brown, Policy Adviser, Horticultural Trades Association; Helen Browning, Director, Eastbrook Farm Organic Meat; Pieter van de Graaf, Scientific Adviser, the Scottish Government; Ian Crute, Chief Scientist, Agriculture and Horticulture Development Board; Helen Ferrier, Chief Science and Regulatory Affairs Adviser, NFU; David Gregory, ex-Technical Director, Marks and Spencer; Brian Harris, BBSRC; Stephen Hunter, Former Head of Plant Health at Defra; Chris Lewis, Fields Farm; John Lloyd-Jones, Countryside Council for Wales; Jeff Waage, Director, London International Development Centre; Robbie McDonald, Head Wildlife Disease Ecology, Food and Environment Research Agency; Tom Macmillan, Executive Director, Food Ethics Council; Martin McPherson, Director, Stockbridge Technology Centre; Ken O'Callaghan, LWEC Programme; Bill Parish, Exotic Diseases Policy Programme, Defra; Howard Petch, Board Member, Commission for Rural Communities; Philip Sketchley, Chief Executive Officer, National Office of Animal Health; Christopher Wathes, Chairman, Farm Animal Welfare Council; and Abigail Woods, Imperial College London.

At a programme level knowledge exchange has been encouraged by various approaches and mechanisms. Central to this has been a sustained approach to strategic influencing. 'Core' stakeholder communities of 200 to 300 key stakeholders have been built around clusters of projects, with an orchestrated succession of workshops, targeted events, internal policy briefings and synthesised outputs. In this way, Relu has aimed to shape the terms of debate for reporting scientific results from the programme. In 2010 a particular focus was placed upon Relu's animal and plant disease core stakeholder group (which comprises 200 individuals), for whom 10 events were organised and promoted:

- Interdisciplinary day for land managers 30 March 2010
- Bovine TB: People, Politics and Culture 12 May 2010
- Bovine TB: Hosts, Pathogens and Environments 13 May 2010
- Regulating plant diseases: the role of stakeholders in governance? 27 May 2010
- Integrated sytems for farm diversification into energy production by anaerobic digestion 28 September 2010
- Practitioner Panel Meeting for "Assessing and communicating animal disease risks for countryside users 7 October 2010
- Responsibility and Cost Sharing Workshop 22 October 2010
- Cryptosporidium workshop 28 October 2010

- Workshop on risk and uncertainty in the context of animal and zoonotic disease management 3-4 November 2010
- Delivering disease prevention: insights from history 17 November 2010

During 2010 Relu also pushed forward its local authority initiative. In all 11 Relu projects have had local government involvement of some sort. This has included 9 national park authorities (Cairngorms, Exmoor, Lake District, New Forest, North York Moors, Northumberland, Peak District, Snowdonia and Yorkshire Dales) and 19 local authorities. There have also been various Parish Councils in Relu research and countless others involved in national Relu events. In 2010, advised by a sounding board made up of representatives from three local authorities, Relu launched a bespoke Policy and Practice Note series, specifically targeted at local government and distributed to local authorities throughout the UK. Two notes were produced in the series: The changing role of local government in managing water resources; and The Big Society: helping communities take action. A Relu session was also run jointly with local authorities at the Local Government Association Rural Commission meeting in September, attended by rural councillors, and at the Local Government Rural Policy Review Group in November.

A seminar on rural data and rural analyses was also organised by the Relu Data Support Service (see 3.5) as part of the 2010 Social Science Festival with the Commission for Rural Communities (CRC): 'Understanding rural communities using social science data', Defra Innovation Centre, Reading, 16 March 2010. This included presentations by Meg Huby as Relu researcher and Relu-DSS presentation of the Rural markers review of UK Data Archive social survey data collections carried out for CRC in 2009.

Figure 3: Formal Stakeholder Engagement in Relu at the Programme Level in 2010

Stakeholder	Representation on Programme Management Group or Strategic Advisory Committee	Representation on national stakeholder forum	Relu Visiting Fellow or Work Shadowing Host	Attendee at Programme Workshop
Aalborg Municipality				√
ACTion with Communities in Cumbria				√
Adam Wellings Consulting Ltd				√
ADAS				√
Advantage West Midlands				√
AEA Group				√
Agriculture and Horticulture Development Board		√		√
Agri-Food and Biosciences Institute, Northern Ireland				√
Agrivert				√
Anglian Water Services				√
Animal Health, Norwich				√
Arthur Rank Centre				√
Assetoptimal				√
Association of Rivers Trusts			√	√
Barfoot Energy Ltd				√
Bayer Crop Science				√
BBSRC		√		√
BCPC				√
BE Birmingham				√
Biogen Greenfinch				√
Biotal Ltd				√
BPEX				√
Brecon Becons National Park				√
British Cattle Veterinary Association				√
British Deer Society				√
British Geological Survey				√
British Sugar Group				√
British Trust for Ornithology				√
British Veterinary Association				√
British Veterinary Society				√

Broads Authority				√
BTCV				√
Bureau of European Policy Advisors, Brussels				√
BV Dairies				√
Cairngorms National Park Authority				√
Care Farming Initiative				√
Carnegie UK				√
Centre for Forestry and Climate Change				√
Commission for Rural Communities		√		√
ConFor				√
Coniston and Crake Catchment Partnership				√
Consultant				√
Country Land & Business Association				√
Countryscape				√
Countryside Council for Wales	√	√		√
CPRE				√
CREH Analytical Leeds				√
Crop Protection Association				√
Cryptosporidium Reference Unit				√
Cumbria Fells and Dales RDPE LEADER				√
David Jarvis Assoc Ltd				√
Deer Commission for Scotland				√
Deer Initiative (England & Wales)				√
Defence Estates				√
Defra	√	√	√	√
Devon Wildlife Trust				√
Dialogue Matters				√
Dickinson Dees LLP				√
Drenthe, NL				√
Drinking Water Inspectorate				√
Druridge Bay Partnership				√
Durham County Council				√
Durham Wildlife Trust				√
Earthcare Technical Ltd				√
East Riding of Yorkshire Council			√	√
Eastbrook Farm Organic Meat				√

EAWAG: Swiss Federal Institute of Aquatic Science and Technology				√
Eden Rivers Trust				√
Envar Ltd/ADAS UK Ltd				√
Environment Agency				√
Environment, Food and Rural Affairs Committee				√
European Centre for Disease Control				√
Exmoor National Park				√
Farm Energy Project				√
Farming and Wildlife Advisory Group				√
Fell Beck				√
Fields Farm		√		√
Food and Environment Research Agency		√		√
Food Ethics Council		√		√
Food Standards Agency				√
Foodchains				√
Foresight				√
Forest Research				√
Forestry Commission England				√
Forestry Commission Wales				√
Forestry Commission, Peninsula FD				√
Forum for the Future				√
Foundation for Common Lands				√
Freelance Farming Journalist			√	√
Freelance Policy Analyst				√
Fre-Energy				√
Game & Wildlife Conservation Trust				√
Garden Organic				√
Go Ape				√
Government Office for Yorkshire and the Humber				√
Government Social Research				√
Green Party				√
Groundwork North East				√
Hains Farm				√
Harnham Water Meadows Trust				√
Harper Adams				√

Health Protection Agency				√
Health Protection Scotland			√	√
Healthy Waterways Partnership, Australia				√
Heather Trust				√
Horticultural Trades Association		√		√
HotRot/Bekon				√
Humber Rural Partnership				√
Hutchinsons Environment Services				√
IOTA				√
IUCN UK Peatland Programme				√
JBA Consulting				√
JG Rural Business Consultancy				√
John Muir Trust				√
Joint Nature Conservation Committee	√			√
Kent County Council				√
Lake District National Park Authority				√
Lanchester Parish Council				√
Launceston Anglers				√
LEAF				√
Leicestershire County Council				√
Lincolnshire County Council				√
Local Government Association				√
Localise West Midlands				√
London International Development Centre		√		√
Loweswater Hall				√
Lowther Estates				√
LWEC				√
Marine Ecosystem Policy Advisors, Australia				√
Marks and Spencer		√		√
Methogen/Fre-energy				√
National Farmers Union		√	√	√
National Office of Animal Health		√		√
National Trust				√
Natural England				√
Norfolk Rivers IDB				√
North East Rural Affairs Forum				√

North Pennines AONB Partnership				√
North Wyke Research				√
North Yorkshire County Council			√	√
Northumberland National Park Authority				√
Northumberland Strategic Partnership				√
Northumberland Wildlife Trust				√
Northumbrian Water				√
Northwest Regional Development Agency				√
Northwoods				√
Norway Veterinary School				√
One North East			√	√
OOWV Germany				√
P.C. Tinsley Ltd				√
Patterdale Parish Council				√
Pesticide Action Network UK				√
ProBiogas				√
Processors and Growers Research Organisation				√
Promar International				√
Public Health Consultant, Ireland				√
Public Health Wales NHS Trust				√
Royal Agricultural Society of England				√
Royal Botanic Gardens Kew				√
Royal Forestry Society				√
Royal Parks Richmond				√
Royal Society for Protection of Birds				√
Royal Veterinary College				√
RuSource				√
Safety, Health & Env. Forestry Commission				√
Scottish Environment Protection Agency				√
Scottish Government				√
Scottish Natural Heritage	√	√		√
Senior Environmental Health Officer				√
Shropshire Hills AONB Partnership				√
Smiths Gore				√
Somerset County Council				√
Stockbridge Technology Centre Ltd				√

Stockholm Environment Institute		√		√
Sust Dev Com				√
SWH Surveys Ltd				√
Teesdale LSP				√
Tenant Farmers Association				√
Terracarbon				√
Trade and Agriculture Directorate, OECD				√
Tweed Forum				√
Tyne Rivers Trust				√
Tynedale Council				√
UKWIR				√
United Utilities				√
UTASS Ltd				√
Vegan Society				√
Veolia Environmental Services				√
Veterinary Consultancy Services				√
Veterinary Laboratories Agency				√
Waste ad Resources Action Programme				√
Water UK				√
Watergate Barn				√
Waterways Partnership				√
Welsh Assembly			√	√
Wessex Water				√
West Midlands Rural Affairs Forum				√
Westcountry Rivers Trust				√
Woodland Trust				√
Yorkshire Dales Millenium Trust				√
Yorkshire Dales National Park Authority				√
Yorkshire Forward				√
Yorkshire Futures				√
Yorkshire Organic Millers				√
Yorkshire Peat Partnership				√
Yorkshire Water				√

4.4 Work Shadowing and Visiting Fellowship Schemes

There were two examples of work shadowing scheme during the year which aims to introduce staff to the action-contexts in which their work may be relevant. There were also 11 Relu Visiting Fellows – a scheme that enables policy makers and practitioners from the commercial, voluntary or public sector to visit Relu research teams with a view to exploring the implications of the research for their work and developing bespoke dissemination activities.

Figure 4: Work shadowing and visiting fellowships in 2010

Work Shadowing		
Host	*Shadower*	*Project*
NFU Communications	Anne Liddon	Relu Director's Office
Defra	Jonathan Cave	The Governance of Livestock Disease
Visiting Fellowships		
Fellow Organisation	*Fellow*	*Host Research Project(s)*
One North East Regional Development Agency	Frances Rowe	CAP Reform projects
Freelance farming journalist	Adam Bedford	Relu projects
East Riding of Yorkshire Council	Graham Chapman	Relu projects
Northumberland County Council	Ruth Machen	Relu projects
Association of River Trusts	Archie Ruggles-Brise	Relu water projects
Welsh Assembly Government	Kathryn Monk	Relu water projects
Otley College	Neil Ridley	Relu projects
Royal Agricultural Society of England	Alan Spedding	Relu disease projects
Relu Visiting Fellow	Stephen Hunter	Relu disease projects
Defra	Alastair Johnson	Improving the Success of Agri-environment Schemes
Health Protection Scotland	Lynda Browning	Comunicating Animal Disease Risks for Countryside Users

12 new visiting fellows were also signed up for 2011 in relation to the new wave of Relu projects on 'Adapting Rural Living and Land Use to Environmental Change':

- Frances Rowe, ONE Regional Development Agency (Smith IV)
- Ruth Machen, Northumberland County Council (Reed IV; Lane IV)
- Jane Ashley, Sustainable Development Commission (Sutherland IV; Scott IV; Franks IV; Phillips IV)
- Colin Walker, East Riding Council (Lane IV, Phillips IV)
- Aletta Bonn, IUCN (Reed IV)

- Stewart Clarke, Natural England (Franks IV, Lane IV)
- Stephen Chaplin, Natural England (Franks IV)
- Jo O'Hara, Scottish Government (Sutherland IV)
- Clunie Keenleyside (Sutherland IV)
- Alison McKnight, Smiths Gore (Reed IV; Sutherland IV)
- Ruth Waters, Natural England (Smith IV)
- Ian Baker, Defra (Lane IV, Phillips IV, Scott IV)

The Visiting Fellowship scheme continues to be very beneficial for the programme. The Fellows have been able to make a strategic input to the development of Relu's knowledge exchange strategy. For example, Visiting Fellows from local government have been instrumental in guiding a local government targeted series of Relu Policy and Practice Notes. Another Visiting Fellow, Alan Spedding from the Royal Agricultural Society of England has actively disseminated Relu research to over 1200 rural professionals. The Fellows are also bringing instrumental insights from policy and practice into research projects. As Stephen Hunter, former Head of Plant Health at Defra explains, he hoped his involvement "has been to provide the plant and, to a lesser extent, animal disease projects with the perspective of a policy maker. I have spent most of my Civil Service career in posts where I have been on either side of the policy-science interface of policy development and/or its operational implementation. … I believe I can help RELU researchers understand the drivers and pressures on civil servants (both generalists and specialists) and politicians and the rationale (or sometimes lack of it) and background to their approach to policymaking.

Visiting Fellows are also themselves finding their engagement with the programme to be fruitful in terms of their own policies and practices. For example, Graham Chapman of East Riding of Yorkshire Council, explained that "Being up to date with the latest research activity in relation to rural land use change was very helpful in developing ideas and activities for the Humber Rural Delivery Pathfinder and the subsequent actions of the Humber Rural Partnership. … There have been spin off benefits for the rural policy work of East Riding of Yorkshire Council, the East Riding Rural Partnership and the Yorkshire and Humber Regional Rural Affairs Forum which is currently operated under contract by the Council". Kathryn Monk of Environment Agency Wales said the scheme strengthened her "position to be able to horizon scan and have up-to-date network of researchers for future ad-hoc or strategic evidence support". Ruth Machen at Northumberland Council described how involvement in the programme has strongly influenced the development of a Local Carbon Framework programme. Another Fellow, Adam Bedford NFU policy adviser and *Farmers Weekly* journalist, similarly described how as a visiting fellow he has "been able to gain a broad overview of the current research taking place" and use this in his "day to day work as a policy adviser; highlighting examples of current research to farmers, discussing this research, taking on views and trying to feed it back in. From a journalism perspective, being involved in the programme as a visiting fellow has added a further dimension to my writing and the readership of FW by providing a different research perspective on issues pertaining to farming and rural areas".

The scheme is also supporting professional development. One Fellow explained how the scheme has enabled them "to bring a more critical approach" to their role, describing how they have tried to "connect key policy areas within my remit with the findings of research from RELU, through the Policy and Practice notes and through the learning I gained through visiting the projects. … Finally, participation in the fellowship scheme has reinvigorated my enthusiasm for the day job – giving perspective and clarity on some of the difficult problems and fulfilling the need for in depth conceptual engagement with some of the challenges faced".

4.5 Project-Level Meetings with Potential Research Users

During the year the projects engaged in several thousand stakeholder contacts in the public, private and third sectors. Over 97 presentations were given specifically by projects to stakeholders in 2009 (Annex B). Individual research projects ran over 24 stakeholder workshops which engaged a wide range of organisations (see Table 3). The programme also initiated a number of targeted internal policy briefings for key stakeholders. This included internal seminars within Defra and Scottish Government.

Table 3: Project-Level Stakeholder Workshops in 2010

Project	***Workshop***
RES 229-25-0008 Waterton	'New forms of environmental governance- experiences and challenges from Loweswater, Cumbria', 3rd December 2010, Penrith, Cumbria. The workshop explored findings from the Loweswater project and together with representatives from government agencies and NGOs (Defra, EA, NT, LDNPA, NWRDA, ACTion with Communities in Cumbria, and others) explored what challenges such institutions face in supporting public participation in environmental management and governance effectively. The keynote address was delivered by Stuart Burgess, Rural Advocate and Chair for the Commission of Upland Communities. The workshop was held on a very snowy day, but despite that, attracted approximately 40 participants.
	Joint Catchment Management Workshop, 29th April, 2010, Department of Sociology, Lancaster University. Attendees were, Kirsty Blackstock (Macaulay Land Institute); Doody Donnacha, (DoE, Northern Ireland); Brian Reynolds (CEH Bangor); Nigel Watson (Geography Division, LEC, Lancaster University); Claire Waterton, Judith Tsouvalis (both Department of Sociology, Lancaster University); Alex Inman, Laurie Smith (external consultant and SOAS, both from Smith's RELU project). This event brought together several researchers working on projects that are tackling 'catchment management' at both academic and practical levels. The workshop was designed to give such catchment management practitioners scope for thinking about the different philosophical and practical approaches of their respective projects, and to think about the challenges of bringing together catchment science and lay publics.
	Loweswater Booklet Meeting, 15 September 2010. Researchers met with Loweswater residents to plan the writing of a booklet that has now been written by members of the LCP and the research team.
RES 229-25-0012 Strachan	'Risk and uncertainty in the context of animal and zoonotic disease management'. See description under RES 229-25-0007 Quine.
RES 229-25-0013 Mills	Approximately 30 stakeholders (from Government, agencies, industry and NGOs) and RELU project team members took part in a workshop exploring the role of stakeholders in governance of plant diseases. Attendance at the workshop was by invitation following stakeholder analysis by the project team to identify

	organisations that had a high interest and/or high influence in the impacts of plant diseases across the supply chain and rural economy. Presentations were given on the aims of the 'Growing Risk' project by Peter Mills followed by presentations from representatives of Defra and SASA on recent examples of stakeholder engagement. Workshop attendees were asked to consider the impacts of plant diseases, management responses and policy implications in two breakout sessions. Concluding discussions considered whether an interdisciplinary (holistic) approach to policy formulation is of value and attempted to refine a model for '3 dimensional policy framing' that attempts to pull together a framework for stakeholder engagement/consultation based partly on the examples presented at the workshop.
RES 229-25-0015 Wynne/Heathwaite	'Policy and disease containment strategies in Avian Influenza: living with uncertainty'. Disease-specific workshop for expert stakeholders (including scientific researchers, policy practitioners and industry specialists) working within the field of Avian Influenza disease containment. Some initial findings from the project data were presented for feedback, validation, identification of data gaps and input on the development of a future framework for exploring cross-disease themes. There were 14 participants at the workshop, covering a range of international viewpoints. These included stakeholders from Egypt, Iran, Germany and Singapore and UK representation from organisations such as the VLA and IAH as well as University researchers.
	'Policy and disease containment strategies in Foot and Mouth Disease: living with uncertainty'. Disease-specific workshop for expert stakeholders (including scientific researchers, policy practitioners and industry specialists) working within the field of Foot and Mouth disease containment. Some initial findings from the project data were presented for feedback, validation, identification of data gaps and input on the development of our future framework for exploring cross-disease themes. There were 23 participants at the workshop, covering a range of international viewpoints. These included stakeholders from Germany, US, NZ, Nigeria, Canada, Sweden and the Netherlands and covered organisations such as the FAO and IAH. There were also various researchers, modellers and policy practitioners from the UK.
	'Policy and disease containment strategies in Cryptosporidium: living with uncertainty'. Disease specific-workshop for expert stakeholders (including scientific researchers, policy practitioners and industry specialists) working within the field of Cryptosporidium disease containment. Some initial findings from the project data were presented for feedback, validation, identification of data gaps and input on the development of our future framework for exploring cross-disease themes. There were 12 participants at the workshop, both from the UK and Sweden. There was representation from organisations such as the NHS, VLA, HPA and water utilities.
	'Risk and uncertainty in the context of animal and zoonotic disease management'. See description under RES 229-25-0007 Quine.
RES 229-25-0022 Banks	'Integrated systems for farm diversification into energy production by anaerobic digestion - final dissemination event', 28th September 2010, Centre for Agricultural Strategy, University of Reading. Seminar presenting results from the various aspects of the project and discussion forum. Attended by 38 mixed representatives of government bodies, industry, agriculture and academic researchers.
RES 227-25-0018 Whatmore	'Understanding Knowledge Controversies: European Perspectives' held in Oxford on 8th March (collaboration between researchers from Oxford, Durham, EPFL, and University of Liege).
RES 229-25-0009 Smith	Upper Thurne Catchment Stakeholder Workshop, How Hill Study Centre, Ludham, Norfolk, March 23, 2010 – catchment stakeholders and research partners

	Upper Tamar Catchment Stakeholder Workshop, Roadford Reservoir, April 20, 2010 – catchment stakeholders and research partners
	Upper Tamar Catchment Stakeholder Workshop, Roadford Reservoir, June 29, 2010 - catchment stakeholders and research partners
	Final Project Communications Workshop for Wider National and UK Stakeholders - *Catchment Management for Protection of Water Resources Rural Economy and Land Use Programme Project* - SOAS, University of London, November 29, 2010 – environment and water professional, researchers and stakeholders including Defra and Environment Agency – 80 delegates
	Approaches to Integrated Catchment Management: Learning from International Experiences, 30th November 2010, London, Follow-up to the conference on 29th November 2010 on Catchment Management for Protection of Water Resources Rural Economy and Land Use Programme Project – workshop in partnership with Defra, Environment Agency and Demonstration Test Catchment Programme – 36 delegates
RES 229-25-0007 Quine	ESRC Festival of Social Science/National Science and Engineering Week -. Public engagement through accompanied visits, Alice Holt, Farnham 12-20th March 2010 - The aim was to explore how people weigh their value for woodlands and the countryside with any potential risks they may encounter. To do this, 4 groups of people (members of the public) were recruited to participate in a one hour walk in Alice Holt woodland in which they were asked to take photographs of features they liked and/or disliked in the woodland. This was followed by lunch and focused group discussions on hazards and risks in woodlands/countryside with a specific focus on Lyme Disease. Forty one people came to the four sessions, with an age range of 21 to 79.
	3rd Project interdisciplinary day, Exmoor - 30th March 2010. The third of three interdisciplinary day meetings led by members of one of the work packages at each of the 3 case study sites. The action of having to describe and participate in activities on the ground and having to explain to third parties, was a stimulating way of exposing and resolving assumptions, understandings and specialist knowledge. Interaction with local stakeholders facilitated discussion of methodologies for communicating animal disease risk. Sixteen people attended, comprising of five stakeholders, one RELU representative and ten team members.
	3rd Meeting of Project advisory board (PAB), London 7th July 2010. Meeting with the project's expert panel to provide an update and gain critical comment on work completed, particularly the projects conceptual framework for risk management. Fourteen people attended, comprising of five Project Advisory Board members, one RELU Research Fellow and eight team members.
	3rd Meeting of project practitioner panel (PrP), Birmingham 7th October 2010. Third meeting of the project's practitioner panel to discuss how the three strands of the project are forming an integrated framework for managing and communicating risk and how this could be applied. Twenty four people attended, comprising of Sixteen Project Practitioner Panel members, one RELU representative, one RELU Research Fellow, one visiting research professor and five team members.
	RELU Inter-project risk workshop, York 4/5th Nov 2010. The workshop on risk and uncertainty in the context of animal and zoonotic disease management was an opportunity to showcase and discuss the work of three RELU funded projects. The workshop involved presentations of findings from the projects and an exploration of their relevance and potential future applications. The first day included sessions on Decision-Making Frameworks, Risk Perception and Communication and a European perspective presented by Prof. Ekdahl from the European Centre for Disease Prevention and Control. The second day looked at Identifying Uncertainty, and Policy Relevance and Priorities for Future Research. Forty one people attended, comprising of three RELU representatives, two RELU

	Research Fellows, eighteen team members from the three projects, and eighteen stakeholders.
RES 229-25-0016 Medley	'Bovine Tuberculosis: People, Politics and Culture', 12th May, Warwick HRI, 50 people. 'Bovine Tuberculosis: Hosts, Pathogens and Environments', 13th May, Warwick HRI, 50 people. DEFRA personnel, academic researchers and industry (e.g. NFU) were the principal attendees. Speakers included Dr Angela Cassidy (RELU Fellow). The first day explored the social science of bTB, and the second day the natural science of bTB. The days were written up into a PP note (#19)
	'Anglo-French Seminar: Animal Health and Welfare', 3-5 June 2010, University of Warwick. Participants were the GoLD team, Professors Gerard Marcou and Cécile Moiroud (University of Paris 1 Sorbonne), Hannah Riches, Nathan Hill and John Walsh (Economists, Animal Health and Welfare Theme Group, Department for Environment, Food and Rural Affairs, London), and Stephen Hunter (RELU Visiting Fellow). The workshop operated under Chatham House Rules. The discussion covered: Exchange of views and perspectives on animal health and welfare between UK and French colleagues; A deeper understanding of the EU's policy on Animal Health and Welfare; UK and French perspectives on how to take forward the regulation of animal health and welfare in Member States , post the Treaty of Lisbon; Consideration of Animal Health Law Proposals: UK; France and EU; A consideration of regulatory issues including UK and French perspectives on regulation; A closer understanding of animal health, food safety and CAP from the UK and French perspectives; Economic, legal and biological perspectives on how to problem share; Tentative analysis from common approaches or distinctive differences.
	'RELU workshop on cost and responsibility sharing', University of Warwick, 22 October 2010. Participants were GoLD team, Professor Peter Mills (Harper-Adams and PI of RELU project), Amy Proctor (RELU), Jo Anderson, Emma Beech, Martin Cox, Colin Parker, Simon Scanlan (DEFRA), David Brown (Horticultural Trades Association), Chris Hartfield (NFU), Tom Rabetts (NFU), Clive Potter (Imperial College, London). The presentations covered the principles, the current (DEFRA) position, livestock farmers' perspectives and the position in relation to plant disease.
RES 229-25-0025 Phillipson	Science in the Field Advisory Group, June 2010, Newcastle. Attendees from the projects case study rural professions.

4.6 Relevance of Research and Potential Impact

The projects are providing insights of relevance to key policy and practice domains. In 2010 there were 39 new stakeholder research links or networks established, 33 occasions where advice, data, or information was provided to policy makers, 9 submissions to government consultations or inquiries, and 359 businesses trained or advised. There were also 120 events focused on public participation, and 15 new decision support tools, methods or protocols (see Table 4).

All of the ongoing projects thought their research had the potential to improve public policies or public services, of which 86% judged their actual contribution in 2010 to have been moderate or high. While 64% of projects thought their research had the potential to improve the performance of existing businesses, of which 78% judged their actual contribution to this in 2010 to have been moderate or high. Finally, 86% thought the research had potential to deliver highly skilled people to the labour market, of which 67% judged their contribution in 2010 to have been moderate or high.

Table 4: Contributions to Policy and Practice in 2010

Strengthening of existing stakeholder-research links or networks	31
Establishment of new stakeholder-research links or networks	39
Submissions to government consultations or inquiries	9
Meetings/occasions where advice, data, or information was provided to policy makers	33
Meetings/occasions where advice, data, or information was provided to businesses	14
Businesses trained or advised	359
Policy makers trained or advised	24
Memberships of stakeholder boards or advisory groups	23
New decision support tools, methods or protocols	15
New material or technological advances	1
Commercialisation: Spin-outs, licences, patents etc.	0
Number of stakeholders temporarily visiting or attached with project	9
Number of researchers work shadowing/placed with stakeholders	5
Number of interactions/events focused on public participation and engagement	120
Number of publications aimed at policy makers	26

Other examples of research impact and influencing during the year include:

OECD Secretary launches water resource report

The Organisation for Economic Cooperation and Development's Secretary General Angel Gurria launched a report by Joe Morris and colleagues from Relu's *Integrated Management of Floodplains* project: 'Sustainable Management of Water Resources in Agriculture', prepared for the OECD. The team is also working on updates to guidance on flood risk appraisal for the Environment Agency and Defra.

Future of the uplands debated

The Future of the Uplands was debated at a joint Relu/Northern Rural Network seminar in Mickleton, County Durham, with over 90 delegates and contributions from the Commission for Rural Communities, Natural England, farmers and other practitioners. The paperback edition of "Drivers of Environmental Change in the Uplands", edited by Aletta Bonn, Tim Allott, Klaus Hubacek and Jon Stewart and featuring contributions from Relu researchers was launched at the event.

Can floodplains deliver everything we need from them?

From the 1930s to the 1970s we thought that floodplains were there to produce more food and many were drained to increase production. Since the 1980s environmental concerns have come to the fore and now flood management is rising up the agenda. How can we balance these competing demands? A new policy and practice note from Relu "Integrated Management of Floodplains" took a look at how an ecosystem services approach can help policymakers to understand the synergy and trade-offs that have to be made.

Paying for upland ecosystem services

Would a new system of incentives, based on the provision of ecosystem services, mean a more secure future for the uplands in the UK and for the vital functions that they perform, such as carbon storage and supplying water to towns and cities? This is what researchers from Relu's *Sustainable Uplands: Learning to Manage Future Change* propose in the

programme's Policy Practice Note No 14. In April the project also organised a two day event "Carbon in the Uplands: threats and opportunities, in partnership with the Heather Trust, the Southern Upland Partnership and the Crichton Carbon Centre.

Relu sponsors CAP reform briefing

Relu sponsored a short course on CAP reform for local and regional policy makers and stakeholders from the private and third sectors. Held under the auspices of the Northern Rural Network, speakers included Elena Saraceno, Bureau of European Policy Advisers, Prof Allan Buckwell, Country Land and Business Association, John Goddard of the Land Use Foresight Expert Panel, Alistair Johnson of Defra and David Harvey of Newcastle University.

Are we doing enough to safeguard gardens and woodland from *Phytophthora?*

The UK Government's response to pathogens threatening familiar garden and woodland plants has been rapid and efficient, but more still needs to be done to combat the invasion of *Phytophthora ramorum* (the cause of the disease sometimes known as Sudden Oak Death) and its distant relative *Phytophthora kernoviae*, according to researchers from Imperial College London. And the public could be playing a more positive role. The team is working on the Relu project *Lessons from Dutch elm disease in assessing the threat from Sudden Oak Death* . They carried out a wide-ranging review of the UK Government's response to the threat, and their report has now been published.

Environment Agency draws on flooding research

The report "The Costs of the 2007 Floods" published by the Environment Agency (EA) was produced by Joe Morris, following on from Relu's *Integrated Management of Floodplains* project, in collaboration with Middlesex University Flood Hazard Research Centre, and included results from the survey of agricultural impacts. The team also worked on updates to guidance on flood risk appraisal. This important manual is sponsored by EA and Defra and will be used to support appraisals of flood risk management investment.

The rural dimension at Science Week event

During Science Week a joint seminar held by the Commission for Rural Communities, the UK Data Archive and Relu's Data Support Service looked at how existing survey data can be used to produce evidence about rural households and rural communities, to inform wider public policy and service delivery debates. Chaired by Michael Winter, presentations and discussion ranged over the availability of suitable data, how it can be analysed for the benefit of rural areas and how this knowledge can be applied.

Bovine tuberculosis debate too polarised

Bovine tuberculosis in cattle herds seems to have become an insoluble problem for farmers and for policymakers. Debate focuses almost exclusively on the role of the badger and researchers working on Relu research projects argue that this is unhelpful, clouding the real issue of cattle health. Relu's policy and practice note no 19 unpicks the threads of the debate and examines options for the future. Relu researchers also organised two one-day workshops in May on Bovine Tuberculosis at Warwick: Bovine Tuberculosis: People, Politics and Culture and "Bovine Tuberculosis: Hosts, Pathogens and Environments".

Researchers contribute to debates on future of Scottish agriculture
Relu projects have been contributing extensively to current debates about Scottish agriculture. James Bullock who is leading the Relu project *Improving the Success of Agri Environment Schemes* and Mark Reed who co leads *Sustainable Uplands: Learning to Manage Future Change* took part in a seminar with the Scottish Government in February. Mark Reed and colleagues also helped to formulate a response to the Inquiry into Future Support for Agriculture in Scotland.

Can interdisciplinarity break down animal and plant disease silos?
Animal and plant diseases are regulated in separate "policy silos" but the two fields could learn valuable lessons from each other in a time of change, according to Relu's policy and practice note no 16: "Policy making for animal and plant diseases: a changing landscape?". Katy Wilkinson (Newcastle University), with Graham Medley and Peter Mills (Warwick University), sets out the current position, looks ahead at new proposals for responsibility and cost sharing and makes the case for looking more coherently at the questions raised. The authors argue that interdisciplinarity is key to addressing questions such as who should be involved in policy formation, who should bear risks and costs, and how stakeholders can be involved in formulating policy.

Relu plays prominent role in peatlands inquiry
The International Union for the Conservation of Nature's Commission of Inquiry into UK peatlands published Scientific Reviews of eight priority topics which were discussed at the 'Investing in Peatlands - the Climate Challenge' conference at Durham University in September. Members of Relu's *Sustainable Uplands: Learning to Manage Future Change* team have been prominent in this work, with Fred Worrall leading on "Climate Change Mitigation and Adapation Potential" and "Impacts of Burning Management on Peatlands" and Mark Reed on "Policy Options for Sustainable Management", with support from the Relu programme.

Sport trumps venison dinners say stalkers
Relu's *Collaborative Deer Management* project has investigated whether higher prices for venison could influence the way in which Scottish estates manage their deer. But the evidence shows that this would have little effect, because revenue from stalking is much more important to them. Stalkers suggested an expansion of commercial stalking of hinds to increase culls, but managing the herd in a way that maximises the number of stags available for shooting is important. Each sporting stag can add up to £22,000 to the capital value of the land. It does not seem realistic therefore to improve financial returns for deer management through promotion of venison.

Deer provide pointers on managing natural resources
Can collaboration assist in the management of natural resources and how can it best be achieved? Relu's *Collaborative Deer Management* project has been investigating these issues, using wild deer as a case study, and published its findings within Relu's Policy and Practice Note. The project developed a participatory framework for promoting collaboration amongst neighbours and between policy-makers and practitioners to negotiate

conflicts over deer management. That work showed the value of GIS maps for combining practitioner and scientific knowledge of natural resource issues across a landscape. The researchers have won additional funding to promote further knowledge exchange. This follow-on project is providing training, 'best practice' dissemination meetings and support to help officials and land managers in the Cairngorms and Cumbria.

The challenges of implementing the European Water Framework Directive

Implementing the European Water Framework Directive will pose challenges for the UK. Relu's latest briefing paper "Water Framework: Implementing the Water Framework Directive" examines some of the problems and the evidence from Relu projects that could help to make this legislation work at local level.

Research takes centre stage in CRC uplands report

Recommendations from several Relu research projects featured in an independent report from the Commission for Rural Communities to the government about the future management of our hills. Researchers are urging the government to develop a more coherent policy for uplands that rewards farmers for the full range of goods and services that they provide. The Commission for Rural Communities report 'High ground, high potential – a future for England's upland communities' Peter Carruthers, expert adviser of the Commission for Rural Communities said "Relu projects have made an important and significant contribution to the CRC 'Inquiry into the future for upland communities in England'. We received evidence arising from five Relu projects via submissions to the 'call for evidence', published outputs of Relu funded research, conversations with Relu researchers and contributions to the Inquiry's series of research seminars. In particular, several Relu personnel played an important and much appreciated role in the last of these. Along with the Inquiry's other evidence streams, Relu evidence has helped shaped the development of the Inquiry and the formulation of its conclusions."

Researchers comment on draft Animal Health Bill

The *Governance of Livestock Disease* project submitted a detailed response to the Government's consultation on their draft Animal Health Bill.

Building good fences could make for cleaner water

Building good fences could make our water cleaner, and help us to meet European standards, according to Relu scientists who have created a computer model to investigate the problem of faecal pollution in UK rivers. The research shows that there is a high risk of faecal pollution entering watercourses within areas with high densities of dairy cattle. The UK has to tackle this problem, not only because of the health risks, but also because of European legislation. Drawing on work from several projects across the Relu research programme, the team investigated different approaches. They found that simple farm-scale solutions are likely to be most effective at reducing the numbers of potentially dangerous organisms entering watercourses – and could work out cheaper both for farmers and consumers.

Regulating plant diseases: the role of stakeholders in governance?
Around 30 stakeholders from Government, agencies, industry and NGOs, and Relu researchers from *Assessing the Potential Rural Impacts of Plant Disease* took part in a workshop in May exploring them role of stakeholders in governance of plant diseases, with presentations on Phytophthora ramorum (Stephen Hunter, formerly Plant Health Division), Dickeya solani (Gerry Sadler, SASA) and Bluetongue (Tonima Saha, Exotic Disease Policy Programme,Defra).

Advising local authorities on rural inequalities
Meg Huby and researchers from the *Social and Environmental Inequalities in Rural Areas* project held discussions with East Yorkshire Unitary Authority about potential uses of the project's data set in policymaking and have also provided advice and data to the High Wealds Area of Outstanding National Beauty.

Research helps local government to address new responsibilities
Local government is being asked to take on new responsibilities for managing natural resources, including water, and the "big society" vision of the new coalition is likely to reinforce this process. European legislation will also make demands and climate change adds to the mix. But there are opportunities too, for authorities to take the lead in building partnerships and finding novel ways of working, to ensure that communities get the safe water supplies they need, and to minimise flood risks. A new Relu policy and practice note tailored specifically to a local government audience and drew on research from across the programme to support authorities in addressing these new challenges. At a Relu workshop on community engagement at the Local Government Group's Annual Rural Commission, Land Use Consultant Alan Woods and Sally Hewitt, Principal Rural Policy Officer for Lincolnshire County Council, outlined the Relu Programme and what it can contribute to this area of work for local government. Discussion and suggestions from the workshop were built into a new Local Government Policy and Practice Note in the Relu series.

Commercial fishing developments put skills and biodiversity at risk
The biodiversity of our rivers and still waters may be at risk from disease and invasion by non native species, and anglers could be losing out too, according to Relu researchers. The team, from the universities of Newcastle, Durham and Hull, found that angling has many positive aspects for conservation: anglers tend to be skilled observers of the natural world, with a keen interest in preserving natural habitats. But a growth in commercial facilities, including artificial still waters, could have a downside, and could put the development of anglers' unique skills and knowledge at risk. Although these newer, artificial fishing facilities can provide good access for families, older and disabled people, there is a danger that the younger generations of anglers who use them may develop a poorer understanding of what constitutes a healthy aquatic ecosystem. And some of these commercial enterprises may be falling down on basic biosecurity.

NERC Fellowship awarded to water resources researcher
Tobias Krueger was awarded a NERC Knowledge Exchange Fellowship. This will fund a 2-year post for him at University of East Anglia to build on the research he has been pioneering under Relu's Catchment management for the protection of water resources

project. Tobi will be working with the Broads Authority and Westcountry Rivers Trust to extend the application of the project's interactive catchment management decision-support tool. There will be a programme of outreach activities including a placement at Defra, where he will be showing policy makers how this kind of tool can be used to support agri-environmental schemes.

Relu researchers take the lead in catchment management projects

The *Catchment Management for Protection of Water Resources* team led a workshop on "Modelling with stakeholders as part of an analytic-deliberative approach to catchment management" at the Defra Innovation Centre in Reading in May, attended by around 50 representatives from Defra, the Environment Agency and Natural England, independent consultancies, water companies, and third sector and academic organisations. The objectives were to develop an outline strategy for a modelling approach, to assemble tools and analyses needed for the Defra Demonstration Test Catchment project and to develop policy and practice for integrated catchment management. Relu researchers Kevin Hiscock, Andrew Lovett and Phil Haygarth are playing a leading role in the Demonstration Test Catchments Project, investigating whether measures taken on farms across a whole river catchment can reduce the impact of agricultural water pollution on ecology, while maintaining food production. This is a joint Defra, Environment Agency and Welsh Assembly Government initiative working in three river catchments – the Wensum in Norfolk plus the Eden (Cumbria) and Avon (Hampshire). The projects all draw on the expertise of land owners, managers, farming and environmental organisations as well as government agencies and researchers. They aim to produce evidence that can be used to improve the effectiveness of agri-environment schemes.

Pursuing disease control worldwide

Sophia Latham from the Assessment of Knowledge Sources in Animal Disease Control team visited the FAO/World Organisation for Animal Health European headquarters in Rome and spoke to representatives from their Foot and Mouth Disease annual meeting about the project. She also addressed the Crisis Management Centre Animal Health team, the operational arm of the Emergency Centre for Transboundary Animal

Research on carbon labelling feeds into World Bank publication

The World Bank has published "Can carbon labeling be development friendly: recommendations on how to improve emerging schemes". The report is based on the Relu project *Comparative Merits of Consuming Vegetables Produced Locally and Overseas*.

Practitioners digest research results

Practitioners from the farming and energy industries took a keen interest in the results reported from Relu's Energy Production on Farms Through Anaerobic Digestion project at an event in Reading. According to the team farm-scale energy production could be profitable for farmers, but they would do better if they feed the digester with waste and crops that grow well in the UK, rather than trying to grow maize. The reports provoked a lively and useful debate amongst delegates.

A written charter for land use could support Big Society action

A written charter for land use could support a "Big Society" approach and enable more integrated management of England's natural resources, according to Relu's briefing paper "Shaping the Nature of England: policy pointers from the Relu programme", a response to the Government's recent consultation on the natural environment of England.

Can farming and wildlife be compatible?

Could farming actually help wildlife to thrive in the countryside in the future? If we look more closely how government policy drives farming decisions, which then impact on animals and plants, perhaps modern farming methods could do just that, according to Relu researchers. Their research has shown that we shouldn't assume profits are the only driver for farmers – we have to understand their attitudes as well. And by looking more closely at the prevalence of weeds, for example, we can begin to identify potential modifications in farming practices that could balance the needs of both food production and wildlife. Relu's policy and practice note no 23 outlines the implications of the research for future policymaking. Researchers investigated how land management strategies of UK arable farmers affect biodiversity, posing the questions: how can targets on bird populations be achieved? And with what social and economic consequences for farming?

- The project developed new methods for mapping weeds (valuable for farmland biodiversity) on whole fields and assessing weed population responses to management. It modelled resultant variations in bird breeding abundance.
- Farm management and ecological outcomes were linked together with farmers' objectives and preferences into a predictive model of land-use.
- For a single farm the research can predict optimal management and weed and bird populations for altered management. At a landscape scale, it can predict aggregate land-use and ecological populations under different assumptions about farmer behaviour.

Does the CAP need a refit?

Revamped agri-environment schemes could play a major role in ensuring we get maximum ecological and economic returns from UK land, according to research findings drawn from across the Relu programme. Briefing paper no 12 *"Informing the Reform and Implementation of the Common Agricultural Policy*" identifies key points from Relu research that could help to steer the reform of the CAP, currently underway. The report advocates designing schemes within an ecosystems services framework, and developing a menu of options that enable each area of land to be managed to maximum ecological effect, and at an appropriate scale. Schemes could include new options for carbon storage, integrated pest management and reduction of public health risks from livestock waste, as well as responding to new disease threats. Stakeholder involvement should become routine, and enable farmers and other local people to contribute their own expertise to securing long term benefits from the land.

Rural Advocate on the participatory challenge for Government agencies

A workshop in Penrith in December explored findings from the Relu project 'Understanding and Acting in Loweswater: a community approach to catchment management' with agency and NGO representatives. The workshop highlighted the

challenges faced by these institutions in fostering public participation. In his keynote address, Stuart Burgess, Rural Advocate and Chair of the Commission for Rural Communities, reflected on the opportunities provided by the political shift towards smaller central government and the devolution of power to local authorities and communities. He stressed that an integrated strategy was needed to realise "the localism agenda", and that national agencies had to be equipped and properly resourced to support local engagement successfully. The workshop concluded that local knowledge and experience were key to such partnerships achieving their aims.

How can flood modelling move upstream?

People whose homes have been flooded are often scathing about "flood models" of their local area and they may mistrust the professionals whose job it is to use them. But Relu researchers have found that if residents have the opportunity to contribute their local knowledge, and are actually involved in creating the models, this can give them more confidence in the outcomes and also make these more effective. Relu's Policy and Practice note no 22 draws on a project in Ryedale in Yorkshire where academics worked with residents, not only coming up with an innovative approach to a flooding problem that had seemed intractable, but also charting new, more open ways of doing science.

New website gives upland communities a platform

A new website from Relu's *Sustainable Uplands: learning to manage future chan*ge project tells the story of the UK uplands and gives people who live and work there a unique platform to express their views via a collection of video-clips, written accounts, photographs, audio material and artwork.

Risk workshop in York

A workshop held on 3rd/4th November in York on risk and uncertainty in the context of animal and zoonotic disease management was an opportunity to showcase and discuss the work of three Relu funded projects: Reducing E coli Risk in Rural Communities; Assessment of Knowledge Sources in Animal Disease Control; and Assessing and Communicating Animal Disease Risks for Countryside Users. Held over two days, the workshop involved presentations of findings from the projects and an exploration of their relevance and potential future applications. The first day included sessions on Decision-Making Frameworks, Risk Perception and Communication and a European perspective presented by Prof. Ekdahl from the European Centre for Disease Prevention and Control. The second day looked at Identifying Uncertainty, and Policy Relevance and Priorities for Future Research.

Researchers brief Defra on the changing parameters of disease

Relu researchers have hosted two workshops on animal and plant disease for key stakeholders. "He who bears: a workshop on cost and responsibility sharing" was organised by the *Governance of Livestock Disease* project at Warwick University in October and attended by members of Defra's responsibility and cost sharing team, plus representatives from the NFU and the Horticultural Trades Association. At "Delivering disease prevention: insights from history" held at Defra's London offices in November as part of a series of internal Relu briefings within the department, Relu Interdisciplinary Fellow Abigail Woods

outlined the history of state intervention in livestock health and revealed historical precedents to the current promotion of farm health planning.

On-farm Anaerobic Digestion commercially viable, but farmers put off by high cost of borrowing

A report on a farm-level economic modelling exercise conducted by the Centre for Agricultural Strategy at the University of Reading concluded that Anaerobic Digestion is economically viable on commercial arable and dairy farms in the UK. AD appears to be fairly resilient in the face of higher commodity prices. Lack of availability of gate fees is not a constraint to AD, but what does appear to be a constraint is the cost of borrowing. AD requires large capital investment, anything from £2-7k per kW, and on most farms this would require significant amounts of borrowing. The cost of servicing this borrowing is critical, with high interest rates putting many farmers off.

Big Society and rural communities

The aim of the Big Society, according to a speech from the Prime Minister, is *"to give citizens, communities and local government the power and information they need to come together, solve the problems they face and build the Britain they want"*. In the publication 'The Big Society: helping communities take action', research from across the Relu programme makes a timely contribution to this agenda and builds on what we know about how to make community engagement successful.

Don't forget tree diseases

Invasive diseases now pose a serious threat to trees, woodland and native plants in the UK. Relu's latest policy and practice note Memory and Prediction in tree disease control investigates what lessons policymakers, scientists and the growing number of people and organisations with a stake in plant biosecurity, need to learn about previous tree disease epidemics when putting in place measures to anticipate and prevent future outbreaks.

4.7 Press and publicity

Relu has again achieved regular coverage and research has been reported across the different types of media, including trade, mainstream national, regional and local newspapers, radio and television. It has also been featured prominently in the research councils' own magazines and websites. The growth in reports on web news sites and discussion blogs is noticeable and enables rather specialist research to be targeted at very specialist groups for example, anglers and farm vets. A comment piece by the Relu Director in the Veterinary Record sparked a particularly large number of responses on a large number of sites. Relu visiting fellows helped to stimulate interest among the farming community by their writing and blogging about the research and a long feature by the Science Communications Manager in Geography Review enabled the programme to reach a new audience of A level students.

4.8 Key Items of Expenditure

Key items of expenditure include: £13.3k on the launch conference *Adapting Rural Living and Land Use to Environmental Change*; £4k on the Relu/SUE workshop on *Strategic*

Land Use: Crossing the Urban Rural Divide; £17.1k on Briefing Papers; £25k on Policy and Practice Notes; £2.5k on work shadowing and visiting fellowships; £3.6k on national stakeholder forums; and £5.1k on UK networking/liaison meetings.

5. Progress of Projects

64 projects (including 34 small seed corn projects and 30 large research projects), 16 PhD studentships and 5 interdisciplinary research fellows started prior to the reporting period. Of these all seed corn projects, 16 large research projects and 4 studentships were completed prior to the reporting period. 8 research projects funded under the second and third calls completed their work in 2010 as well as 2 studentships. 9 new projects were awarded on the Adaptation of Rural Living and Land Use to Environmental Change. A group planning meeting was held in Manchester with researchers and Principal Investigators from 9 Relu projects funded under the fourth call. In addition, meetings were conducted with 3 projects at which inter-project links and synergies were discussed. Expenditure on individual project visits and planning meetings amounted to £1.3k.

5.1 First Call Projects on Sustainable Food Chains

RES-224-25-0041, Prof H Buller, University of Exeter
01 Jan 05 - 30 Dec 07
Eating Biodiversity: An Investigation of the Links between Quality Food Production and Biodiversity Protection

This project investigated the links between quality food production and biodiversity protection by looking at the benefits of grazing farm animals on natural grasslands to farm businesses, product quality, ecological management and human health.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0044, Prof G Edwards-Jones, University of Wales, Bangor
01 Dec 04 – Mar 08
Comparative Merits of Consuming Vegetables Produced Locally and Overseas

The project posed the question 'Which is best; to produce fruit and vegetables in the UK, or to import produce from overseas?' Researchers investigated different aspects of growing local food, including the environmental impact, the emission of greenhouse gases (GHGs) and compared these with importing produce from Spain, Kenya and Uganda. They also sought to understand how important the localness of vegetables was to consumers.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0048, Prof WP Grant, University of Warwick
01 Nov 04 – 31 Oct 07
The Role of Regulation in Developing Biological Alternatives to Pesticides

Fungi that kill insects are naturally widespread in the environment and can be used to control insect pests of crop plants. Fungal bio-pesticides have been produced in the past, but little work has been done on their environmental sustainability. The project looked at the potential for these and examined the rules governing the introduction of bio-pesticides

in the UK, Europe and the USA to assess whether changes in regulations might encourage a move towards bio-pesticide use.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0066, Dr DC Little, Stirling University
03 Jan 05 – 31 Jan 08
Warmwater Fish Production as a Diversification Strategy for Arable Farmers

This project aimed to develop technical guidelines for a sustainable system for tilapia culture as a potential diversification strategy for farmers in the UK. It involved a comprehensive analysis of the practicality, sustainability and viability of the system through laboratory and on-site investigations, as well as trials with commercial partners.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0073, Prof B Traill, University of Reading
01 Apr 05 - 30 Apr 08
Implications of a Nutrition Driven Food Policy for the Countryside

This project drew on economics, psychology, ecology, crop science, animal science and human nutrition to assess the potential for improvements in the nutritional quality of soft fruit, lettuce, and meat and milk, and the possible implications for both human health and the countryside.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0086, Dr D Chadwick, IGER, North Wyke
01 Feb 05 - 30 Jun 08
Sustainable and Safe Recycling of Livestock Waste

This project evaluated the changes needed in management practices to limit the risk of pathogen transfers from grazing livestock, manures and other farm wastes to water courses. The effect of these changes on the economics and practicalities of farming were investigated as well as the 'knock-on' effects for local communities and industries reliant on clean water supplies.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0090, Prof R Shepherd, University of Surrey
01 Feb 05 – 31 Jul 08
Managing Food Chain Risks

Too often in recent crises in food and agriculture (e.g. BSE, E. coli, Foot and Mouth Disease) a narrowly technical perspective has been taken: the social, political and economic issues have been addressed too late in the process with the result that many

people lose confidence in the authorities' management of the situation. The project therefore developed and tested method to incorporate the thinking and values of stakeholders into the scientific modelling of food chain risks.

The project's findings were summarised in the 2008 Programme Annual Report.

RES-224-25-0093, Dr AS Bailey, Imperial College London
01 Feb 05 – 31 Jan 09
Overcoming Market and Technical Obstacles to Alternative Pest Management in Arable Systems

This project investigated both the efficacy of alternatives to chemical pesticides and issues for producers in switching to them. Two alternatives were explored: habitat manipulations to encourage predators and parasites and semiochemical odours (natural smells) to manipulate predator distribution.

The project's findings were summarised in the 2009 Programme Annual Report.

5.2 Second Call Projects on People and the Rural Environment

RES-227-25-0001 Dr K Hubacek, University of Leeds
01 Mar 06 – 31 Oct 09
Sustainable Uplands: Learning to Manage Future Change

The aim of this project was to combine knowledge from local stakeholders, policy-makers and social and natural scientists to develop approaches to anticipate, monitor and sustainably manage rural change in UK uplands. The project started by identifying the current needs and aspirations of policy-makers and those who work, live and play in three large and very different upland case study areas (Peak District National Park; Nidderdale AONB and several catchments in Galloway, Scotland).

The project's findings were summarised in the 2009 Programme Annual Report.

RES-227-25-0002 Dr E Oughton, Newcastle University
01 Mar 06 – 31 May 09
Angling in the Rural Environment

Angling is increasingly important as the rural economy moves from being dominated by production (agriculture, forestry), to being dominated by consumption (leisure, tourism). But rivers are under further pressure from other human activities, so their ability to sustain flora and fauna may be at risk. This project looked at the case studies of the Rivers Esk, Ure and Swale and analysed the complex relationships between river, fishing, biodiversity and institutions of governance and practice. Results of the research are relevant to policy on integrated development of the rural river environment.

The project's findings were summarised in the 2009 Programme Annual Report.

RES-227-25-0006 Dr S Stagl, University of Vienna
01 Jan 06 – 30 May 10
The Effects of Scale in Organic Agriculture

This project investigates what causes organic farms to be arranged in clusters at local, regional and national scales and assesses how the ecological, hydrological, socio-economic and cultural impacts of organic farming may vary due to neighbourhood effects at a variety of scales. It will map out some alternative scenarios for future growth of the organic sector in the UK, and evaluate the potential positive and negative effects that different patterns of organic cultivation might have, at a variety of scales, in the future.

No End of Award Report yet received

RES-227-25-0010 Dr J Bullock, CEH Dorset
01 Oct 06 - 31 Sep 11
Improving the Success of Agri-Environment Schemes

The study is considering how well wildlife habitats are created under agri-environment schemes. So far these schemes have had limited effects, possibly because of a combination of less than optimal management by landowners and the inability of plants and animals to colonise new habitats, either because they are already so rare, or because of obstacles in the landscape. Researchers will examine the effects of training on farmers as well as the availability of different species and habitat types in the wider landscape, to enhance the biodiversity benefits of agri-environment schemes.

Despite the original intention that ELS could operate as a 'broad and shallow', 'hands off' scheme with little or no specialist advisory and/or training input required, interviews with farmers in two different areas of the country have revealed concerns about the establishment and on-going management of particular options. Although many farmers felt that some management requirements were 'easy' or 'straightforward', significant minorities, and in some cases the majority, felt that others were 'difficult'. The farmers taking part in this research were mostly very receptive to idea of agri-environmental training and they were very positive about the group training events and ELS management. These events addressed a number of concerns farmers had expressed in earlier interviews, boosting confidence and providing practical knowledge of techniques, seed mixtures, etc. A number of the comments made about the training suggest that it impacted on farmers' locus of control, that it gave them the skills, knowledge and belief that their management actions could produce an improved environmental benefit. The farmers also benefited from being with peers in a similar position to themselves and being able to share their experiences of managing ELS options. The project team met with Defra stakeholders in July to discuss findings with reference to developing Environmental Stewardship. As well as presentations from Matt Lobley and James Bullock, the Defra team were given copies of the papers. In response Alistair Johnson said "The issue you are investigating, namely why agri-environment schemes on the ground don't always deliver the solution to the original problem, has clear links and implications with policy development and delivery.

Consequently we would be very interested in looking at your analysis and conclusions as they emerge and I'm sure there will be opportunities to provide policy and departmental economist views on them". In addition, Steve Peel, the Senior Agroecology Specialist at Natural England became a Visiting Fellow because he feels that the project has the potential to influence policy and delivery via the internal Natural England (NE) Land Management Performance Programme (LMPP) and the Defra/ NE project Making Environmental Stewardship More Effective (MESME).

RES-227-25-0014 Dr J Irvine, Macaulay Institute
01 Feb 06 - 31 Dec 09
Collaborative Deer Management

The management of deer provides a useful case study for the use of ecological resources in the countryside, because there are so many associated costs and benefits. This project investigated how well people involved in deer management work together and how this can be improved so that the costs of managing deer are minimised and the benefits maximised.

The project's findings were summarised in the 2009 Programme Annual Report.

RES-227-25-0017 Professor J Morris, Cranfield University
01 May 06 – 31 Mar 09
Integrated Management of Floodplains

This project explored changes that have occurred over the past 40 years, in areas which were 'defended' under flood defence schemes. Case studies of selected schemes, first studied by the research team in the early 1980s, show how land use has changed in the meantime and the consequences for livelihoods and the management of flooding problems. The project is helping to inform decisions about the future management of floodplains.

The project's findings were summarised in the 2009 Programme Annual Report.

RES-227-25-0018 Professor S Whatmore, Oxford University
01 Mar 07 – 30 Jun 10
Understanding Environmental Knowledge Controversies

This project studied flooding and water pollution as pressing rural land management problems that are controversial among scientists and the public, especially those directly affected. To explore these environmental 'knowledge controversies', the project developed cutting edge tools and approaches that pinpoint which practices result in which impacts, and account for how environmental science is produced, used and disputed. The project set out to develop a different way of "doing science" that involves social and natural scientists working closely together, and with local people, in 'Competency Groups'.

Typically, environmental knowledge controversies such as flooding have been seen in science and policy communities as troublesome problems to be avoided. This project investigated how knowledge controversies might play a generative role in developing the

capacity of democratic societies to handle environmental uncertainty more effectively. Flood risk management relies on the scientific practice of predictive modelling. Even as modellers acknowledge the provisos and uncertainties that attach to their work, so such provisos become dulled with the automation and standardisation of modelling undertaken by the engineering consultancies on which government agencies rely for their flood risk estimations. The project explored how the process of expert knowledge production might be opened up to public interrogation, such that the uncertainties admitted in robust scientific practice become admissible also in the public realm. The analysis demonstrated that what 'modelling' involves varies significantly in different contexts, notably between commercial and academic arenas of practice. Equally, the contractual terms set by government agencies were shown to be a major influence on the standardisation of modelling practice and the erasure of the provisos and uncertainties attached to flood risk estimation. This work informed the design of an experimental method for doing flood risk science differently. The competency group work was key to the development of an alternative knowledge-theoretic approach to modelling, incorporating the richness of local knowledge into the process. The models developed were co-produced through collaborations with people affected by flooding which refigured the expertise of flood scientists and other group members, producing models specific to flood risk management in the two locations. These models are spatially-explicit and time-dependent, allowing active exploration of different possible interventions and their effects on flood risk reduction by all group members. Although the models were coded by one of the 'university' members, the content of the models and their use in practice was grounded in the wider, collective work of the groups. The Ryedale Group's 'bund-model' performed effectively enough to prompt the regional Environment Agency to adopt a new flood risk reduction strategy, while the Uckfield 'overflow' model is now performing in the development of a land management strategy to reduce flood risk in collaboration with the regional Environment Agency. The project has been selected as a case study in public engagement by the HEFCE/RCUK Beacons for Public Engagement initiative.

RES-227-25-0020 Dr A Karp, Rothamsted
01 Jan 06 - 31 Sept 09
Impacts of Increasing Land Use Under Energy Crops

If more land is to be converted to energy crops, then we need to know more about the implications of climate, soil and water availability, and the possible impacts of such crops on the environment, social acceptance and rural economy. Using the East Midlands and South-West regions as study areas, this project has reviewed current knowledge and conducted new state-of-the-art social, economic, hydrological and biodiversity research to develop an integrated scientific framework for Sustainability Appraisal (SA) of the medium and long term conversion of land to energy crops.

The project's findings were summarised in the 2009 Programme Annual Report.

RES-227-25-0024 Professor I Bateman, UEA
01 Jan 06 - 30 Apr 10
Modelling the Impacts of the Water Framework Directive

The project is developing a hydrological-economic model to assess the costs and benefits of changing farming practices in the Humber catchment area in order to produce a healthy river environment with good amenity value in line with the European Water Framework Directive.

The ecosystem services approach to decision making seeks to clarify the contribution of the natural environment to human wellbeing. This project provides probably the most thorough UK (and arguably worldwide) application of the approach to date. In particular it delivers the fundamental integration between natural science and socio-economic analyses. The project has developed a novel Integrated Modelling for Integrated Effects (IMIE) approach to fusing together natural science and socio-economic analyses. Here models of the physical environment were integrated with those of economic and social systems in ways which allowed changes in either dimension to impact upon the other. Within this approach, techniques were developed for incorporating the extreme spatial variation which characterises the natural environment. This permitted a new locationally sensitive approach to decision making which significantly enhances the efficiency of resource use. Advanced techniques for the valuation of non-market goods and services (such as those provided by ecosystems) were integrated within the locationally specific IMIE approach to yield robust values of the impacts of decisions. This provides a much firmer basis for predicting the consequences of change, whether inspired by policy, market forces or environmental. The methodology was developed through empirical analysis of a complex and policy relevant real world issue: ie the EU Water Framework Directive (WFD) within the context of ongoing Common Agricultural Policy (CAP) reforms. In order to maximise the policy relevance of this work, this empirical development process was informed throughout by frequent formal and informal interactions with relevant policy groups (e.g. Defra and the Environment Agency) and stakeholders (e.g. farmers and the NFU, CIWEM, regional groups, etc.) The IMIE approach within the context of WFD implementation provides a spatially and temporally sensitive econometric behavioural model of rural land use. The model was found to be a highly robust predictor of land use and land use change under a wide variety of conditions. Its outputs include estimates of farm income and land use under present or feasible future conditions. The land use predictions generated by the model were used as base inputs to a model of river water quality developed to permit transferability across different catchments. This applied advanced hydrological modelling techniques to relate land use (both arable mix and livestock type and stocking intensity) and the physical characteristics of river catchments (including urban land use and associated sewerage inputs) to river water quality in terms of both nutrient levels (e.g. nitrate pollution) and faecal indicator organisms (FIO). Costs associated with the WFD run into many billions of pounds, and Cost Benefit Analyses (CBA) assessments are an increasingly common element of decision making. The ecological quality outputs from the IMIE process form the inputs to an advanced, spatially sensitive model of the benefits of river water improvements. The project developed this last phase of the analysis through a custom designed survey of households drawn to capture variation in both socioeconomic and

demographic circumstances as well as changes in access to rivers of different qualities and characteristics balanced against access to the full range of alternative recreational resources. The methodology was then adopted as the basis of the pan-European *Aquamoney* programme which was funded by the EU. The IMIE framework provides policy makers with the first truly integrated decision analysis tool combining natural science, economics and social science. It yields a raft of results arising from any given change in policy, market or environmental drivers. Tests across a number of scenarios (including policy changes in taxation, quantity restrictions and regulations; as well as environmental drivers such as climate change) revealed important and policy relevant results. Changes in drivers were assessed in terms of: impacts on land use and agricultural production; changes in farm incomes; shifts in river water quality both in terms of nutrients and FIOs; changes in the ecological status of those rivers; alterations in the number of recreational visits undertaken and their value. Interesting features of the results obtained from these analyses include the following:

(i) Forecast climate change is likely to increase farm incomes in those (mainly upland) areas which are currently disadvantaged by lower temperatures and higher rainfalls.

(ii) FIO levels cannot be adequately controlled through purely rural land use measures such as reductions in livestock intensities, urban measures are the major issue here.

(iii) Significant improvements in river water quality can be generated by policies aimed at altering agricultural land use, but that these will lower farm incomes

(iv) The major potential beneficiaries of such river improvements are in urban areas.

(v) Within any given locality, the value of additional river quality enhancements diminishes significantly once an initial river is improved.

(vi) The most efficient policy would be to focus upon improving sufficient urban rivers rather than pursuing the WFD objective of improving all rivers in all areas to pristine ecological standards.

RES-227-25-0025 Professor W Sutherland, University of Cambridge
1 Feb 06 - 31 Dec 09
Management Options for Biodiverse Farming

The variation in management of farms is a key determinant of differences in biodiversity. This study is linking together models of the dynamics of weed and bird populations and farm management decision-making. These will then be applied to help us to understand how the variability in arable farming practices, and intensity affect biodiversity and farm livelihoods. The work will be used to determine the most effective ways of targeting agri-environment schemes.

This project investigated how the land management strategies of UK farmers affect the biodiversity of the countryside. It brought together social and natural scientists to

understand the factors influencing farming practices and the implications of variations in practices for biodiversity. The aim was to develop models of farm land-use by integrating its economic, social and biological components. The project developed an interactive software tool for classifying the type and strength of interest and influence, that different stakeholders, such as farmers, government, and commercial organisations have, in the management of arable farms. This has been useful in showing how stakeholders exert influence to achieve their particular interests, for example through land ownership or legislation. An innovative feature of this study is that a survey of farmers' objectives and preferences was designed to produce results for direct input into a predictive model of land-use. This model determines the optimal management of a farm, given constraints such as the time and equipment available, soil type, commodity prices, labour, and input costs, taking into account the farmer's land-use objectives. This was used to predict landscapes based on crop prices and agricultural subsidy structures, and compared our predictions with actual land-use recorded by the Farm Business Survey. The team found that a model that included non-profit objectives, such as risk management and preference for the number of crops managed, improved predictive capability compared with a model based on profit-maximisation alone. Weeds are very important in determining farmland biodiversity, but good data on populations and dynamics are extremely time consuming to collect. The project mapped whole fields, developing a new method for assessing weed population responses to management for integration with other models and vastly outstripping previous studies in scale. The resultant dataset consists of maps of weeds within ten fields per farm, over three years. This, in itself, is a unique resource. The results show that there are significant variations in density between ecologically and economically significant weeds. The latter, comprising species such as Blackgrass, tend to be dominant. Patterns of weed abundance and management are enormously variable even within the same crop. Birds suffered the most publicized losses of biodiversity due to farming practices and bird populations underlie the principal monitoring of ongoing changes. The project developed statistical models of variation in bird breeding abundance with respect to cropping, field boundary characteristics and landscape composition across 880 lowland farmland 1km squares. The models integrated predicted bird population consequences with the models of farmers' cropping choices. The results showed that crop types were less important than landscape composition and field boundary characteristics in determining absolute bird abundance, but are probably more important in driving changes in numbers. A separate analysis considered how land-use heterogeneity (i.e. the mixing of arable, grass, woodland, etc.) affected bird counts. More threatened species responded negatively to heterogeneity, unlike generalist species and contrary to previous research results. This work integrates research at several scales. For a single farm it can (i) predict optimal management, (ii) measure the degree to which actual behaviour deviates from this optimum, (iii) produce average weed densities for different crops, (iv) predict weed populations and bird populations for altered management. At a landscape scale, it can predict aggregate land-use and ecological populations under different assumptions about farmer behaviour. The main result from this work was that profit maximization does not provide a good description of actual farming practice. Instead the inclusion of farmer-specific stated preferences improved models and gave predicted power. This emphasises the need to include social data in models that attempt to recreate agricultural landscapes. The enormous variability in weed and bird populations also cautions that local farm and individual farmer differences

need to be considered. The work on farmer decision making has, for the first time, linked social data with farm management and ecological outcomes. The models contribute to answering several policy questions, including:

- What would be the best policy measures to achieve the targets on bird populations set by the government?
- What determines which new farming methods will be adopted by farmers?
- What will be the social and economic consequences of biodiversity conservation?

This could enable best practice models for arable farm management and is particularly important given that the use of certain herbicides is set to be curtailed by the government, meaning that management practices could change considerably.

RES-227-25-0028 Professor P Armsworth, University of Sheffield
01 Jan 06 - 31 August 09
The Sustainability of Hill Farming

Taking the Peak District as a case study, the project examined how hill farmers are likely to respond to major changes in the Common Agricultural Policy and the consequences for upland landscapes and bird biodiversity.

The project's findings were summarised in the 2009 Programme Annual Report.

5.3 Third Call Projects on the Management of Animal and Plant Diseases and on Sustainable Rural Planning

RES-229-25-0004 Dr M Huby, University of York
01 Aug 07 – 31 Jul 09
Social and Environmental Inequalities in Rural Areas

This project examined patterns of social and environmental inequalities in the distribution of social, economic and environmental goods and services. Having identified inequalities, researchers considered whether they can be regarded as unfair or unjust including the judgements of local residents.

The project's findings were summarised in the 2009 Programme Annual Report.

RES-229-25-0005 Dr C Potter, Imperial College London
01 Sep 07 – 27 Aug 10
Lessons from Dutch Elm Disease in Assessing the Threat from Sudden Oak Death

This work examined the threat to trees and woodlands in the rural landscape from Sudden Oak Death (SOD) in the light of experience of the Dutch Elm Disease (DED) outbreak of the 1970s. It brings together historical research methods to investigate memories of DED amongst experts and members of the public, with modelling tools to map the likely spread and impact of SOD.

The research analyzed the biology, policy and economics of the Dutch Elm Disease outbreak of the 1970s to see if lessons can be drawn in relation to the prevention, management and control of present day tree disease threats. The reconstruction of the epidemic drew on archival research, interviews with key informants and modelling work to conclude that biology trumped policy at an early point in the outbreak. The disease entered the UK earlier than previously thought, probably late in 1962, incubating slowly but then spreading very rapidly. This rapid spread was due both to its inherent virulence as a disease system but was also aided by human movements of diseased timber that were restricted only very late in the day. Scientific experts were initially slow to identify the new disease but, even when confirmed as a threat, policymakers were reluctant to put containment measures in place to begin to manage the outbreak. Debates within government about Dutch Elm Disease were dominated by concern about exposing the Treasury to escalating costs. This resulted in responsibility for disease control being devolved to poorly resourced local authorities. The main conclusion is that, in any event, prevention would have been better than any attempted cure. Earlier and more aggressive sanitation felling would not have slowed the disease spread to any significant extent but port inspections and quarantining of diseased timber might have prevented establishment of the disease in the first place. The 'sudden oak death' pathogen now affecting trees, woodland and heathland in the UK is thought to have entered the UK through the nursery trade. It affects susceptible trees like Japanese larch, Douglas Fir, beech, ash, birch, sweet chestnut and evergreen oaks, as well as many shrubs. In a manner strongly reminiscent of Dutch Elm Disease, the authorities seem currently to be dealing with an epidemic with unpredictable characteristics. New susceptible species are being discovered as the epidemic unfolds and attempts to contain the outbreak appear to have failed. The plant health authorities in the UK appear to have acted with reasonable speed to attempt to contain the outbreak but these measures, and the considerable efforts made to bring garden owners, landowners and other stakeholders on board, have had limited success. This is due both to the complexity of the disease and its unpredictable and shifting host range but also due to resistance from some large garden owners and others to the removal of diseased material. Despite important biological differences, there are growing parallels between this outbreak and the Dutch Elm Disease epidemic. Whereas Dutch Elm Disease rapidly became uncontrollable because of its ability to spread very rapidly across a given host range, the sudden oak death system is proving equally uncontainable due to its capacity to infect new types of plant host species. The cardinal lesson to be drawn from both outbreaks is the same – it is far better to prevent the entry of a disease than to attempt to contain it once established. But the recent Sudden Oak Death outbreak also illustrates how hard this principle is to implement in the contemporary setting of a European Single Market. In tracing the outbreak to a breach of biosecurity within the European horticultural trade which enabled a diseased plant to be brought into the UK, people interviewed for this research also recognize how difficult it is to ensure proper inspection and accurate diagnosis of the large (and growing) volume of plant imports involved. The researchers conclude that more public debate is needed concerning the nature and extent of the threat from tree diseases. The surprisingly low level of awareness or understanding of the tree disease threat translates into a comparatively low willingness to pay for control measures, as expressed in valuation surveys. Public awareness needs to be raised, both in order to establish a stronger sense of

personal responsibility for preventing tree disease spread (as gardeners, landowners and visitors to the countryside), but also to elicit more support and a greater willingness to pay for any more restrictive measures and policies that may in future be necessary. Equally, key stakeholders - notably environmental, farming, forestry and horticultural groups and organizations - need to learn from history and be more aware of other country experience in their assessment of the threat from invasive pathogens. Environmental agencies and environmental groups arguably need to give more attention in their campaigning and advocacy work to the threat to biodiversity, our horticultural heritage and other public goods from invasive diseases than they do currently. Finally, within expert circles, there is a need to develop a better and more critical understanding of the interlinked biology, economics and policy of biosecurity measures and of the difficult trade-offs that will need to be made between freer trade and effective biosecurity. Expert biosecurity discourse is heavily focused on the risk assessment tools and largely technical procedures that have been developed to anticipate and manage outbreaks. Beginning at European Union level, there is a need for a more critical and interdisciplinary analysis of the underlying causes of the growing threat to biosecurity and of conflicts between those advocating further market opening and those arguing for restrictions on trade in the interests of biosecurity.

RES-229-25-0007 Dr C Quine, Forest Research
01 Sep 07 – 30 Nov 10
Assessing and Communicating Animal Disease Risks for Countryside Users

Many people take pleasure from outdoor leisure activities but surprisingly little is known about how best to warn countryside users about the potential for problems such as Lyme Disease without scaring them away or spoiling their enjoyment. This research will help those involved in the countryside to better understand how to deal with diseases such as Lyme Disease, how to effectively communicate the degree of risk, and how to encourage preventative action such that the countryside continues to be a source of pleasure and well-being for its users.

Three study sites were selected to provide a range of environmental conditions and countryside use: peri-urban parkland, accessible lowland forest and heath and remote upland forest as represented by Richmond Park on the fringe of Greater London, the New Forest in Southern England, and Exmoor in South West England. The risk assessment study at the study sites showed that ticks were present in very many more habitats than are currently emphasised in risk communication. Modelling of the population dynamics indicates complex and in some instances surprising responses to management of host populations. The biological knowledge emphasises the wisdom of preventative actions, and in particular the merit of post-visit precautions because selective avoidance of tick habitats does not seem feasible, and tick eradication is impossible though local tick abundance may be reduced. The research into risk perception and communication considered patients diagnosed with Lyme disease, countryside visitors, and those who make a living in land-based activities. Neither those who had suffered disease, nor a broader sample of countryside users considered avoidance of the countryside or major modification of behaviour during a visit, as an appropriate response to risk. There was a distinct preference for post-visit precautions, an option that is consistent with the delayed transference of

bacteria from tick to human, but which would be less appropriate with some other zoonoses. Information on the disease and precautions was obtained from a wide variety of land-based organisations. Despite a view that the risk was small compared to other hazards, many organisations nevertheless provided information – particularly to staff - but also to visitors. Information varied in content, and there was interest in developing greater consistency of approach between different organisations. By developing scenarios of future land management and visitor use the research enabled stakeholders to identify fresh perspectives on future challenges in visitor and disease management. Profiles of potential users for the case study sites suggested considerable variation in countryside knowledge, and thus prior preparedness for hazards such as ticks. Interactions between local and national level initiatives in providing information, for example when there are outbreaks of new diseases, were seen to be particularly challenging. Two frameworks were developed. A conceptual framework identifies the potential organisational responses to disease incidence, one of which was influencing behaviour of countryside users. A second framework provides cues to customise risk communication to the specifics of time and place, making use of comprehensive biological understanding. There is scope for further refinement of these frameworks to identify those involved in choice of response option, and participating in risk communication. The main implication is that the proportionate and effective response to most zoonotic diseases is to influence behaviour, so that people using the countryside take appropriate precautions to protect themselves. Many organisations still need to understand that influencing behaviour is about more than risk communication which in turn requires more than just the provision of information; so, successful behaviour change will require a diverse range of actions from different people and organisations. A range of disciplines needs to be involved in considering how to encourage precautionary behaviours, so that strategies are based on sound biological knowledge, as well as an understanding of risk communication, how messages are received and which sources are trusted. Land managers are key to achieving success and they could work with health professionals to share and develop knowledge, formulate response strategies, and identify target audiences. Together, health authorities and land managers could establish an authoritative knowledge base on which individuals and organisations could draw. There should be new organisational links to enable this to happen.

RES-229-25-0008, Dr C Waterton, Lancaster University
01 Jun 07 – 31 Dec 10
Testing a Community Approach to Catchment Management

The aim of this research is to carry out an interdisciplinary study aimed at sustainable catchment management in Loweswater, Cumbria and to assess the transferability of the approach to other places and problems. The research is shaped by a new institutional mechanism or 'new knowledge collective' set up by the local community, stakeholders, and researchers.

The research addressed a specific environmental problem encountered at Loweswater - the occurrence of potentially-toxic blooms of blue-green algae on the local lake - through both 'interdisciplinary' and 'participatory' methodologies. The three research objectives were:

1. *To create a mechanism* that would enable decision making by the community- and institutional-stakeholders and form a possible basis for improving ecological, economic and social sustainability within the Loweswater catchment.
2. *To carry out high quality interdisciplinary research* in order to produce a catchment knowledge-base to inform decision-making. This included research into upland farm economies, land and water ecology, institutional 'governance' and responsibilities for land and water quality, local understandings and knowledge of Loweswater, and socio-economic and cultural challenges faced by the residents.
3. *To assess the 'transferability' of the approach adopted,* and to question whether bringing residents, institutions and researchers to work together could a) be beneficial; and b) be done elsewhere, and if so how, at what scales, and for what kinds of problems.

A variety of ecological, agronomic, and sociological methods were employed, including surveys of soil, vegetation and land, monitoring of water quality and fish, interviewing of institutions/local residents/farmers/other local businesses, and examination of national and international policies pertaining to land and water quality. The project aimed to set up a participatory forum that opens up, rather than closes down, questions about what is at stake, ecologically, economically and socially for Loweswater, and possibly for other places like it. The forum, 'the Loweswater Care Project' (LCP), consistently drew local residents, institutional stakeholders and researchers together for challenging debates over a two and a half-year period and is now sustained by local residents. Loweswater was found to be a rich terrestrial environment (e.g. in habitats) relative to comparable upland areas. Farming is almost wholly low-intensity beef and sheep farming, although both stocking rates and fertiliser input have increased in the last 50 years. Loweswater's aquatic environments (the lake and its feeder becks) have been extensively managed over the last 100+ years and, linked to farming intensification, have suffered declining water quality. The latter highlights the acute sensitivity of this particular land-water 'system' to what are quite small-scale changes (e.g. relatively small increases in inputs of nutrients, and/or minor shifts in the biology of the food chain within water bodies). Very recent results of lake water monitoring show lower levels of available phosphorus, the main limiting nutrient for blue-green algae, along with lower levels of chlorophyll *a*. If these results are the beginning of a trend, this is 'good news' and shows that recent moves towards more sensitive management of the land and of nutrient inputs around the lake have had positive effects within a relatively short time. Evidence from other surveys suggests that measures such as the good maintenance of septic tanks and slurry tanks may also be beneficial. This is likely to be the case in spite of the fact that some aspects of the phosphorus-algae cycle cannot be directly controlled (the most important of these being the 'recycling' of phosphorus from lake sediments). Loweswater is not only sensitive to physical changes it is also fragile in economic and social terms. Loweswater is populated increasingly by an ageing cohort of people, largely retired, relatively wealthy, 'offcomers' and resident low-income farmers. Employment/business opportunities are almost nil, and there are fewer and fewer young people able to work and live in the valley. There is also a shortage of affordable housing. The economics of hill farming are precarious. Interviews revealed significant shifts and pressures on Loweswater farming over the last 30+ years. These include decreases in farm labour, a decrease in the number and a consequent increase in the size of farms and an

increase in stress due to increasing outside control and paper work. To date only 3 of 8 farmers with land draining into Loweswater have known successors who will inherit the business, and land amalgamations have taken place even during the limited time of this project. Researchers, institutions and residents debated within the LCP about the future of Loweswater and the possible implications of working farms disappearing from the landscape. Findings from the work on governance and management revealed a distinctive shift underway, both nationally and regionally, towards a more integrated approach to the use and protection of land and water. Nevertheless, the desired move from fragmented to integrated catchment management is problematic for several reasons. Different agencies work at different spatial scales and have different priorities and so cannot easily co-ordinate policy or its implementation. Agencies and other institutions are unsure how to respond to and link with 'bottom-up', catchment-level initiatives such as the Loweswater Care Project. In addition, small and relatively remote lakes and catchment areas, such as Loweswater, struggle to attract management attention particularly if their water quality problems are not widely known or publicised. Experience at Loweswater suggests that the transferability of a mechanism like the LCP to other places, scales and varieties of environmental problems should be possible. However, as knowledge transfer activities with other initiatives like the Coniston and Crake Partnership and the Shropshire Hills AONB confirmed: successful, active involvement of communities also depends on whether or not regulatory agencies and institutions can both recognise and support bottom up collaborative work. This may require some shifts in decision making power and re-negotiation of roles and responsibilities.

RES-229-25-0009 Mr L Smith, SOAS, University of London
01 Jun 07 – 31 Dec 10
Catchment Management for Protection of Water Resources

This project is investigating how to extend the scientific and social accomplishments of innovative catchment management programmes in the USA, and other European countries to the UK. A catchment management 'template' will be derived which compiles and assimilates scientific understanding and governance procedures as tested in actual decision making and management practice in case study catchments. This will provide a framework to integrate interdisciplinary assessment of methods to protect water resources.

The end of award report from the project is due to be submitted soon.

RES-229-25-0012 Dr Norval Strachan, University of Aberdeen
01 Oct 07 – 28 Feb 11
Reducing Escherichia coli O157 risk in rural communities

E.coli is a very serious threat to human health. It can be devastating and sometimes fatal, and children and elderly people are at particular risk. But we still know little about how it is spread in rural environments. This project is investigating how stakeholders perceive the risks of E.coli and how we can reduce the risks of people becoming infected.

Researchers have found a lack of knowledge about E. coli O157 in visitors to rural areas and limited awareness in farmers in low-infection areas. This evidence was shared with the

Independent Investigation into Godstone Farm E. coli O157 outbreak to inform recommendations to reduce infection on farm attractions. The Health Protection Agency reported on this in June 2010. Based on the antibody results researchers have identified the major risk factors associated with E. coli O157 infection in rural communities. In particular different soil types are of importance for the survival of O157 in Scotland and Wales. The research has also confirmed the importance of contact with farm animals as a pathway of human infection and the effectiveness of handwashing as being both practical and effective in reducing E. coli O157. Relatively high levels of seroprevalence were found in the groups studied (which included farmers and abattoir workers, rural and urban residents) indicated relatively frequent exposure. Notable differences were observed in prevalence between the four study groups, and between participants in north Wales and the Grampian region. The ratio or rural to urban cases was the same in North Wales as it was in Grampian. It was known previously that incidence in Wales was lower and hence these results suggest that both environmental and food-borne pathways of infection are lower in North Wales than in Grampian. Stakeholder engagement with a broad range of organisations is still taking place and a meeting with the Food Standards Agency Scotland has initiated further dissemination. A member of the team was invited to join the All-Wales Zoonoses Group and will present a full report of the study shortly to this group which includes representatives from the Welsh Assembly Government, Environment Agency, Food Standards Agency, veterinary organisations, the livestock and food sectors and a variety of health bodies.

RES-229-25-0013 Professor P Mills, Harper Adams University College
01 Sep 07 – 28 Feb 11
Assessing the Potential Rural Impact of Plant Disease

UK crop production is vulnerable to a plethora of pathogens some of which directly affect crop yields, disrupt the food chain and impact on land use and wider society. The aim of this project is to develop a critical, inter-disciplinary appraisal of the potential impacts of plant diseases (food and non-food) on land use and the UK rural economy.

Plant diseases ranked fourth highest out of 12 potential risks to the supply chain in 2008. Stakeholders identified a number of plant diseases that pose a future threat to the UK supply chain including potato blight, *Septoria* and *Fusarium,* mildews and rusts in wheat crops and *Phytophthora ramorum* in the ornamental sector. In the event of any serious outbreak, it was felt that primary producers and growers would suffer the greatest financial losses, bearing the consequences of the decline in marketable yield and increased spending on disease eradication. A governance model for plant health representing stakeholder engagement has been proposed and presents an approach which aims to capture both the key players who may need to interact and the potential interactions/tensions between those key players. The model aims to capture the generic players and interactions that could form part of the decision making process of plant health governance and connects policy makers to those who provide data to assess risks and impacts. A combination of biological and economic approaches in the modelling of plant disease risk has demonstrated the potential contribution that this approach can make, and it can be expected that these bio-economic models will increasingly inform policy in the future. More than 50 stakeholder groups with an interest or influence were identified and mapped. This exercise, not surprisingly, showed

a significant separation of coordinates between organisations. Organisations falling into the 'high interest/high influence' sector (key players) included both those responsible for policy (Defra), those delivering plant health policy and those funding research into plant diseases. These stakeholders have traditionally had a role or influence in formulating plant health policy. Representatives from these organisations took part in a workshop exploring the role of stakeholders in governance of plant diseases. They were asked to consider the impacts of plant diseases, management responses and policy implications and concluding discussions examined whether an interdisciplinary (holistic) approach to policy formulation is of value and attempted to refine a model for '3 dimensional policy framing' that attempts to pull together a framework for stakeholder engagement/consultation based partly on the examples presented at the workshop.

RES-229-25-0015 Professor B Wynne, Professor L Heathwaite, Lancaster University
01 Jul 08 – 01 Jul 11
Assessment of Knowledge Resources in Animal Disease Control

Containment is a controversial issue in animal disease outbreaks. Strategies often come under the spotlight, particularly when human health may be at risk or when animal and farm welfare issues are promoted in the media. This project is building more integrated strategies of containment by bringing together expertise in public health, sociology, microbiology, epidemiology and veterinary science, environmental science, human geography and medical statistics.

As the major part of project data collection, an interview framework was devised by the research associates bringing together a plan of scientific, technological and management (social and political) questions with which to consult with key personnel identified in each of the three disease case study areas (Foot and Mouth Disease, Cryptosporidiosis and Avian Influenza). In addition, a disease conceptual framework has been drawn together entitled: Strategies for containment of livestock disease: an interdisciplinary framework for the analysis of uncertainties in science-policy with specific reference to the case of *Cryptosporidium.* Researchers have conducted interviews with a variety of different stakeholders and the project is now nearing the end of the data gathering stage. Analysis has revealed a number of emerging themes on uncertainty and dispute in strategies of disease containment, that are cross disease in nature but which may vary in consistency between different diseases. Uncertainty is shown to be produced at strategic, tactical and operational levels of containment, and across the different arenas of disease prevention, anticipation and alleviation. An interdisciplinary approach has an important contribution to make, but is absent from current real world containment policy. Focused, disease-specific stakeholder workshops provided an excellent forum in which to examine these initial findings in an expert setting and also created an opportunity to gather international viewpoints on these diseases and their containment strategies. The project has also maintained an excellent working relationship with Defra via the project's External Advisory Group. The researchers have continued to engage in work shadowing at Defra under the most helpful guidance, attendance at aa variety of meetings e.g. Animal Disease Policy Group meetings and held has interviews with staff as well as researchers work shadowing in the department.

RES-229-25-0016 Professor G Medley, University of Warwick
01 Nov 07 – 31 Oct 10
The Governance of Livestock Disease

We know that sick animals produce less meat and milk, and provide less profit, so it is not just their welfare that suffers. Animal disease can also seriously affect consumer demand at home and abroad. This project considered a range of issues around several different cattle diseases, how policy on one disease affects others and how different organisational levels interact in tackling disease outbreaks.

The research posed four questions relating to endemic diseases of livestock, which are present all the time in the UK. The first considered what the best frameworks for understanding endemic disease control would be. Results showed the importance of "problem framing" in the management of livestock disease. For example, the definitions of which diseases are endemic and which exotic are essentially driven by policy and political considerations. Diseases defined as exotic, attract central government resources for research, and considerable resources are diverted to remove the disease when it enters the UK. In contrast, endemic diseases generally receive far less government attention and are regarded as problems for farmers. Consequently, farmers learn to live with them, and adopt management practices that might mitigate their impact, but which might also enhance their persistence. A framework was developed that combines the epidemiological modelling (i.e. mathematical descriptions of the processes of disease transmission), economic process (e.g. whether disease freedom is a public good) and political considerations (e.g. whether the disease affects human health or international trade) to classify diseases. Bovine tuberculosis (bTB) is the exceptional endemic disease. It has a high political profile and considerable impact on government resources. A review of the National Archives showed that the involvement of badgers, has made the disease unusual, because the government has failed to reconcile opposing, polarised views, resulting in "intractable policy failure". There are multiple groups who have an interest in livestock disease, and they approach the problem from different directions: livestock health, animal welfare, ecological conservation, productivity and profitability, and as a potential political issue. These different perspectives mean that the interpretation of scientific evidence is contested, and it is difficult to find consensus based on general principles. For example, the precautionary principle suggests that, in the face of uncertainty, decisions are taken to avoid the worst case outcome. But for bTB, if conservation is the main concern, then the precautionary principle dictates not culling badgers, but from the viewpoint of animal health and productivity, culling badgers is the most pragmatic action.

During the period of the research, the government developed plans to change the way in which livestock disease is managed: the cost and responsibility sharing initiative, in which the costs of disease management to the livestock industry, along with more control of decision making. Researchers contributed two reports to the consultations for this change. They suggested a regulatory framework (i.e. where government proscribes the rules and conditions, but not the implementation). They also thought it prudent for animal keepers (i.e. farmers individually and collectively) to have a central say in what and how disease is

regulated and advocated the regulation including all diseases, not only those which are deemed important by the current framing. This would require that a new regulatory body with a budget for research to determine the impact of different diseases, and develop the necessary technologies (e.g. diagnostics and vaccines). The project also looked at what factors determine farmer decision making processes, and what their impacts are. They found that patterns of disease (e.g. presence of a disease in a herd) are largely determined by farmer decisions (especially buying and selling of animals). There are two important aspects of these decisions. First, movement of animals has different effects on different diseases. Unusually, the project considered multiple diseases simultaneously (most research and decision-making treats different diseases separately and independently). Selling cows from a herd might be good for one disease (e.g. if they are infected and infectious) and might be bad for another (e.g. if they are immune). Findings reinforce the conclusions that farmers acting individually cannot completely eliminate disease from the UK. Some form of collective action is required so the risks and benefits of disease control are shared in such a way that it is to the benefit of all. Overall, it is possible to see that disease (and therefore its control) is determined by the interactions between the natural science processes (e.g. biology and epidemiology), and social science processes (e.g. economics, politics and law). These interactions are mutually reflexive, i.e. if policy changes, then epidemiology will change, which will cause policy to change.

RES-229-25-0022 Professor C Banks, Southampton University
01 Oct 07 – 30 Sep 10
Energy Production on Farms through Anaerobic Digestion

This project examines the potential for development of anaerobic digestion on farms, and the contribution this could make to rural development and agricultural diversification.

Anaerobic digestion (AD) on farms can provide additional income through using the biogas to generate electricity and heat or upgrading it to a transport fuel. This contributes towards renewable energy targets, with the option of supplying the energy to local communities. It also offers environmental benefits by reducing greenhouse gas (GHG) emissions associated with farming, and promotes the recycling of nutrients in place of artificial fertilisers. The process can use energy crops, agricultural residues and wastes, and by careful planning and adaptive land use can maximise the use of whole crop biomass into both food and energy markets. The research aim was to develop and verify rigorous models for analysis of these claims and assessment of the commercial viability, energetics, land use and societal implications of diversification into on-farm energy production through AD. The UK Government is currently promoting AD as a key renewable energy technology and sees farm-based systems as playing a major role. To stimulate the development of AD, new policy measures and financial incentives have been introduced, including feed-in tariffs for renewable energy supplied to the electricity and gas grids; doubling of the entitlement to tradable renewable energy certificates; and a digestate protocol and publically available specification (PAS) to allow deregulation of digestate under the EU Waste Framework Directive. The research concluded that these have gone some way towards promoting the uptake of AD on farms, but some points regarding the regulatory structure for AD are still unclear (e.g. planning, taxation and the use of digestate). The results also showed there

were no regulatory or fiscal measures to promote on-farm AD from a purely environmental perspective, and that regulation and rewards had focused more on European Union drivers aimed at energy production and the diversion of urban organic wastes from landfill. Economic modelling showed that AD is commercially viable using crops as the feedstock, and would allow a 300-hectare arable farm to double its profit. The best crops to digest were found to be sugar beet and wheat which can be grown within crop rotations. Digestion would remain profitable even if market prices for crops increased by 50%, but this also depended on maintaining the current level of subsidy for energy production through the feed-in tariff scheme. The commercial case for AD on a dairy farm was less certain, with a 6% predicted increase in profit when animal slurry only was digested. Economic viability could, however, be significantly enhanced by importing pre-processed food waste which enhances biogas yields and can balance the farm's fertiliser needs, reducing both the costs of purchase and the GHG emissions associated with production. AD can process a wide range of crops and residues, and the impacts of this on ecosystem services provision were investigated using an environmental risk assessment framework. The results showed that crops could be selected to minimise risks and maximise benefits: favoured plants included legumes to reduce nitrogen requirements and flowering crops to attract insects and bird populations. Crops grown as feedstock did not need to be 'weed-free', thus reducing herbicide and pesticide requirements. Crops from headlands and marginal areas could also be used, helping to maintain these areas under stewardship. The process is beneficial in treating slurries and manures as this reduces uncontrolled GHG emissions from storage; it was less certain whether digestion would aggravate or alleviate further emissions during land application but there were ecological advantages from the better availability of nitrogen to the crop. One of the greatest advantages of AD was the energy and GHG emission savings potentially gained from artificial fertiliser displacement. In the case of arable farms, where part of the crop was used for energy production, nutrients captured by digestate recycling made a significant contribution to farm profits by reducing fertiliser buy-in costs. Digesting the slurry produced by one dairy cow can reduce methane emissions by 25 kg and generate 1000 kWh/year of electricity: a typical dairy farm could supply most of its electricity requirements by slurry digestion. Nutrient self-sufficiency could be achieved by closing the agricultural production and urban waste generation cycles through importing food waste back onto the farm for energy generation. Each tonne of food waste digested on farms could replace 9.5 kg of mineral nitrogen fertiliser, saving 105 kWh of energy and 77 kg CO_2 equivalent emissions. A survey of 2000 farmers in England found that ~40% were interested in AD. Potential users tended to have larger farms, were more likely to be owner-occupiers and were younger and better educated than average. Barriers to adoption were seen as high establishment costs and the perceived difficulty of obtaining planning permission. Focus groups and a consumer survey established that most consumers were happy for crops to be used for energy production, although they considered that one of the main benefits of AD was as an alternative to landfilling organic wastes. Many thought that cattle and pig manures were the most suitable feedstocks. There were concerns that introduction of AD on farms might increase traffic on rural roads although in general the public were supportive of AD and would be willing to pay higher taxes to provide grants encouraging uptake. The research provided guidance to Government and its agencies on issues associated with the planned expansion in this technology. It is hoped that the outcomes will further influence the choice of policy drivers to enable AD to realise its full

potential in providing environmental benefits, particularly in reducing GHG emissions and promoting sustainable nutrient use through integration of on-farm digestion with the recycling of food wastes.

RES-229-25-0025 Jeremy Phillipson, Newcastle University
01 Jun 08 – 18 Aug 11
Science in the Field: Understanding the Changing Role of Expertise in the Rural Economy

This project explores the current and potential role of field-level advisers as knowledge brokers between scientific research and land management practice, with a focus on how their knowledge and expertise are constructed and disseminated. The research looks specifically at knowledge transfer practices within three case study professions (rural vets, wildlife ecologists and land agents/surveyors) using a mixed-methods approach which includes interviews, work shadowing and observation of continuing professional development activities.

Significant progress has been made on the project to date in line with objectives. Interviews have been carried out with professional associations, field-based applied ecologists, land agents and vets, and land managers and work shadowing/observation has been completed. The researchers have also continued to develop SIAM (Stakeholder Impact Analysis Matrix), an analytical tool for exploring how Relu research is influencing policy and practice and how stakeholders engage in research and to what effect. This is helping us to understand the nature and impact of knowledge exchange processes. Data for 2009 were analysed and compared to the 2008 data. An influential Relu Briefing paper was generated from this work. From the interview and work shadowing data, a number of key analytical themes have been developed which consider the nature of expertise. This includes: explorations of the expert-expert/expert-inexpert interface; the relationship between land management professions and the regulatory state; an examination of the composition of field-based expertise and a consideration of the significance of field-generated expertise. The project is developing ideas around expert-expert interaction and the notion of an ecology of expertise; advisor-farmer enactment; and the role of field-professionals as knowledge brokers. Philip Lowe continues his engagement with the veterinary profession drawing on findings from the project, following the publication of his 2009 report. The report had major impact in 2010 including establishment of the Veterinary Development Council. The findings from Science in the Field are also guiding the Relu programme's knowledge brokerage initiatives with the professions (e.g. through work shadowing and visiting fellowship schemes) and more broadly its thinking on knowledge exchange and stakeholder engagement which are being promoted across the Research Councils.

5.4 Fourth Call Projects on Adaptation of Rural Living and Land Use to Environmental Change

RES-240-25-0004, Dr R Pain, Durham University
01 Jun 10 - 31 Dec 11
Building Adaptive Strategies for Environmental Change in River Catchments

Agricultural practices will need to change if we are to achieve more sustainable environmental futures. Research is already investigating the role played by rural land management in delivering the ecosystem services necessary to reduce climate change impacts but scientific prescriptions do not in themselves effect behavioural changes. This research takes an alternative focus by seeking to understand the ways in which the working practices of rural land managers frame climate change.

The project aims to develop new forms of engagement, using Participatory Action Research (PAR) as a means of creating adaptation strategies for environmental change. The research will review how engagement is being done with farming communities by organisations such as the Environment Agency, the Department for the Environment, Food and Rural Affairs, the Farming and Wildlife Advisory Group, National Farmers' Union and rivers trusts; explore how novel forms of PAR can be used to build networks and capacity for rural land management; and provide guidance on how PAR can re-frame critical policy issues in ways that better reflect the experiences and aspirations of land managers.

RES-240-25-0006, Prof W Sutherland, University of Cambridge
01 Nov 10 – 31 Oct 11
Linking Evidence and Policy for Managing Biodiversity in the Agricultural Landscape

In environmental research there is a considerable gap between the generation of results by the research community and the needs of practitioners and policymakers. The challenge is, to ensure that the information from previous research - including that from existing and completed Relu projects - is available to practitioners in a form they can use, and in a location they can access when they have the need.

Science and policy have to be linked together and we have to investigate interventions that are social, economic and physical (such as changes in farm management). There is considerable discussion and debate about the most appropriate management for European farmland and about the best means of maintaining and restoring biodiversity within the agricultural landscape. At present advice is offered through advisors and a range of publications, however the evidence-base for the conservation recommendations is often unclear. The project is examining the potential solution of an integrated practice-led process for identifying social and physical management options, assessing evidence and identifying the priority policies. It should then be possible to assess those areas that are of highest priority for further research and review. The final task will be to assess relationships between the actual range of interventions and quality of evidence.

RES-240-25-0009, Prof D Harvey, Newcastle University
01 Oct 10 – 31 Mar 12
Sustainable Cultivation of Upland Environments

This project is looking at three questions: how we articulate and communicate whole system assessments and inherently uncertain predictions of the causes and effects of environmental change; how we reconcile conflicting interests with common necessity and purpose and how we encourage interdisciplinary working, stakeholder engagement and knowledge exchange.

Sophisticated and complex computer models of these systems have been built, but have had limited impact in answering these questions. Apart from the technical difficulties with such models, there are simply too many different interests and understandings about the systems to reflect all, or even a representative set of opinions and perceptions. So the models are either too simple, or irrelevant. But the process of creating a model does tell us something about the environmental systems. It ought to be possible to communicate our separate and different understandings about the ways in which these systems work without getting bogged down in technical detail or buried in sophisticated computer models. The project sets out to identify the key systematic relationships between, for instance, land use, landscape appearance and environmental effects, and also identify the major differences of judgment and knowledge about the ways in which these key relationships work - what they mean for the management of the system. The researchers are exploring this approach with a number of stakeholders and practising landscape managers, focusing, in the first instance, on the Northumberland National Park. The aim is to develop a set of mechanisms and procedures (a 'scope') to do this, with the primary purpose of helping articulate and communicate different perceptions and understandings of the major relationships and issues. The project will illustrate the use of the 'scope' to systematically and coherently identify and communicate future options and scenarios.

RES-240-25-0012, Dr Mark Reed, University of Aberdeen
Oct 10 – Mar 12
Sustainable Uplands: Transforming knowledge for Upland Change

The British countryside is changing rapidly as a result of human activity, climate change and other pressures. Upland areas are particularly sensitive to these changes. If we are to adapt successfully to manage future challenges, we need to be able to understand what is currently happening and what our options for shaping the future might look like. This project aims to improve our understanding of how generated through research can be most effectively transferred into useful policy and practice.

If current challenges are to be addressed we must draw on a variety of knowledge sources, including that of academic researchers and the expertise of land managers and others linked to the countryside. New knowledge will sometimes be needed in the face of change, but we must also find better ways to build on the extensive knowledge already available. This project is investigating how researchers can ensure they ask the right questions, relevant to rural society, and how we can ensure that the findings are made useful to the widest range

of potential users. The project will also initiate a new upland research policy and practice network that can develop a shared agenda for future partnership work.

RES-240-25-0016, Dr Alister Scott, Birmingham City University
01 Jul 10 – 31 Dec 11
Managing Environmental Change at the Rural-Urban Fringe

The spaces where countryside meets town are often amongst society's most valued places yet there seems to be little understanding and integrated management of these spaces within the UK. What is this "rural-urban fringe"? How is it changing and why? And how can environmental change be managed more effectively where uncertainty, diversity, neglect, conflict and transition commonly feature?

In this project the expertise and experience of academics and practitioners is being combined. Initially the team are exploring social and natural science concepts from spatial planning and ecosystem services to identify and evaluate management issues and needs. From these, they will identify strategic principles and apply them within two rural-urban fringe case study areas, using desk studies, policy-based assessments and visioning exercises incorporating local stakeholders' perspectives. Results from the project will promote an integrated and spatial model for rural-urban fringe management and signpost further research addressing environmental change.

RES-240-25-0018, Mr Laurence Smith University of London
01 Oct 10 – 31 Mar 12
Market-Based Mechanisms for Protection of Water Resources

Faced with climate change, many of our catchments are already under stress from high demands for water and from diffuse and some point source pollution. The risk and severity of flooding may also be increasing. We need improved ways to protect water resources at source and alleviate flood risk. This requires change in land use and farming practices and the cooperation of land users. Advice and capital grants backed up by regulation can take us so far, but this project investigates how we may go further by incentivising landowners to set aside targeted areas of land with most beneficial effect for water protection.

The project is investigating 'Payments for Ecosystems Services' (PES) schemes. These involve a voluntary transaction in which a land use providing an environmental service is paid for by one or more beneficiaries. The project is in partnership with the Westcountry Rivers Trust's WATER project in South West England, which aims to develop a market-based catchment restoration scheme, and will evaluate the scheme. Success will demonstrate a means to strengthen adaptive land management for water protection whilst maintaining viable farm businesses under conditions of environmental change. It is a key premise that a PES scheme for water protection requires networks, partnership working and creative knowledge exchange. Three key groups are: providers of environmental services (land managers); technical intermediaries (the agency managing the scheme); and beneficiaries of services (the people and organisations that pay). Research outputs will include: a synthesis of global PES experience for water resources, assessment of farmer

attitudes and costs, market analysis and stakeholder mapping, methods for targeting land use change and assessing resource protection benefits, assessment of risks of pollution swapping, and knowledge exchange and dissemination.

RES-240-25-0019, Dr Jeremy Franks Newcastle University
01 Oct 10 – 31 Sept 11
Collaborative Conservation in Agri-Environment Schemes

The aim of this research project is to explore whether collective contracts will increase the ecological effectiveness of agri-environment schemes (AES). Species' range and the scope of landscape are typically larger than individual farms, so why are AES options struck with individual farmers on a farm-by-farm piecemeal basis? Collective contracts would allow neighbouring and near-neighbouring land mangers to jointly enter agreements to conserve and protect the environment.

The research is generating insights into the ecological benefits of collective contracts; the barriers land mangers face in working with neighbours to improve the environment, and the role conservation NGOs might play in helping them overcome these barriers. Therefore the outputs will include (i) a review of the ecological benefits and disadvantage of designing AES at the landscape scale, (ii) the findings from three case studies and a survey of farmer to identify the likely support for collective contracts, the barriers to them participating in such options and the support they would like to help them overcome these barriers, and (iii) findings from a survey of conservation NGOs to examine how they currently function and to determine what role they may play in helping farmers overcome the barriers. Arguably the primary beneficiary will be the environment. If collective contracts increase ecological effectiveness of AES and increase their economic efficiency, for example, by reducing total transaction costs, there is more incentive for governments to intervene in the market, which would itself help deliver environmental improvements.

RES-240-25-0020, Dr Elizabeth Oughton Newcastle University
Aug 10 – Sept 11
Flood Management in Borderlands

The aim of this project is to help develop better resilience to flooding through natural flood management in a rural area. It will do so by supporting the development of networks of knowledge exchange and cooperation between stakeholders including land managers, members of statutory agencies, and local government, businesses, and local residents.

The area being studied lies on the English-Scottish border, covering sub-catchments of the river Tweed. The landscape includes moorland, forestry, upland livestock grazing and arable farming. In addition to the administrative difficulties of managing a river across a border the area is subject to complex environmental designations and rural development regimes that make integrated management difficult. Climate change projections suggest this region may experience more severe weather and associated flooding in the future. There is thus a pressing need to increase the flood resilience of the region.

The project is being organised through four work packages. The first will re-examine existing data and previous academic studies of natural flood management. Using findings from these data researchers are asking selected groups of expert stakeholders to make choices about the possible land management options. Wider comments from the community are being recorded through a questionnaire survey. Researchers will return to the expert group of stakeholders with the maps that combine both natural science information on soils and water in the catchments with a wide range of local views. An important part of the project will be to understand how different stakeholders learn as new knowledge becomes available. The project is working with the Tweed Forum, a charitable organization committed to sustainable catchment management that brings together stakeholders from both sides of the border. Tweed Forum is giving administrative support and will work shadow the project to ensure continual exchange between researchers and stakeholders.

RES-240-25-0025, Dr Martin Phillips University of Leicester
Dec 10 – June 12
Rural Communities Adapting and Living with Climate Change

The research is exploring the impacts on rural communities of the social and environmental effects of climate change. In particular it assesses the degree to which three drivers of rural transition - governmental policies for climate change mitigation and adaptation, alternative/counter-cultural visions and practices, and environmental changes associated with climate change - might present quite contrasting futures for rural communities.

The project is investigating how rural communities might variously engage with, adapt to and drive forward particular futures. This is being undertaken through a programme of work that seeks to foster creative knowledge exchange and learning between governmental policy makers, alternative environmentalists, academic researchers and rural communities. A steering committee of people who are experts on these three selected drivers of rural change, is reviewing the different rural futures presented by the three drivers and their discussion is being used to inform the development of climate change mitigation and adaptation future scenarios. These scenarios will then be employed in an interdisciplinary examination of three different rural communities. Visual representations of the potential futures will be created, presented to and discussed with residents in these communities. The degree of engagement, resistance and transformation of the scenarios will be examined by the research team, who will also present their findings on community responses to the expert steering committee. The project's outcomes will include an evaluation of the potential for creative knowledge transfer between the three knowledge communities that constitute its expert steering committee and the degree to which people in rural communities are likely to embrace, ignore or resist particular climate change mitigation and adaptation strategies and practices.

5.5 Interdisciplinary Fellows

RES-229-27-0003 Althea Davies, University of Stirling
01 Mar 07 – 31 May 10
Foundations for the Future: Learning from the Past (Lessons from the Past for the Future of the Uplands)

This interdisciplinary fellowship explored how knowledge about the way landscapes have been formed historically might influence how those who inhabit or visit those areas today appreciate them. It drew on a range of different kinds of evidence, including historical records, archaeology and environmental data, such as pollen preserved in bogs, to trace changes in the upland landscapes of the Peak District and Sutherland over the past 500 years. Using techniques developed by economists to assess people's values regarding landscape change or conservation, the research looked at how information from the past affects their preferences for the future.

The project revealed that although the ecological community does value long-term evidence, there is infrastructural resistance to incorporating additional sources of knowledge into the evidence-base due to pressures to meet existing targets. This indicates the need for engagement both at policy-level and with local stakeholders to introduce and embed long-term concepts into the governance arena and decision-making frameworks, as well as developing and testing strategies that can be applied to specific situations to increase local resilience. On local scales, the case study results show that, despite spanning nearly c.100 years, ecological survey records for Peak District moors are not representative of the range of habitat variability, and may produce baselines that underestimate the extent of change and sensitivity of the UK's drier peatlands. In Sutherland, combined long-term and short-term insights indicate that current legislative and stakeholder emphasis on oak in habitat definitions for Atlantic woods are too narrow to ensure sustainability, and that managed livestock disturbance may also be a more feasible means of ensuring regeneration than relying on natural processes. Many of the changes recorded in both case studies lie beyond the scope of conventional ecological datasets. This indicates the value of reference points that are apt to the ecosystem rather than convenient to human timeframes. Policy and practice impacts are relatively limited as bringing unfamiliar sources into established decision-making frameworks requires continued interaction to introduce the concepts and also ensure that long-term ecologists are sufficiently familiar with the needs of potential users. These goals are being actively pursued through networks like Bridging the Gap, an informal group of ecologists, conservation managers and palaeoecologists interested in exploring the ways in which long term perspectives can help understanding of present ecosystems and ecosystem processes and predict future responses to environmental and management change. Through this network, experience gained during this fellowship and by other long-term ecologists who have also established good local partnerships is helping to forge common agendas and increase awareness to effect longer-term change.

RES-229-27-0002 Evan Fraser, University of Guelph
01 Sept 07 – 31 Aug 10
Integrating Economic and Land Use Models to Anticipate Rural Vulnerability to Climate Change
In this interdisciplinary fellowship, Dr Fraser uses tools from a range of disciplines to consider how climate change may affect food production and distribution, and the rural economy. Dr Fraser assesses the importance of these factors in a range of different circumstances and apply this knowledge to predicted changes in our climate, to see what the effects might be.

The research has used historic cases to combined conceptual advances in a number of disciplines (comparative history, development studies, landscape ecology, ecological economics, political science) to identify food systems "vulnerable" to environmental change and published comparative work where relatively minor weather anomalies sparked major food-crises as a way of understanding how our own society may respond to similar shocks. Specifically, Dr Fraser has investigated the Irish Potato Famine, Ethiopia in the 1980s, and famines in India in the Victorian period and explored how economic marginalization and a lack of effective formal institutions led to highly productive yet homogenous landscapes that were vulnerable to environmental change. He conducted empirical studies that use a mixture of qualitative and quantitative methods to understand how land use patterns are influenced by socio-economic drivers and conducted research on how class, education and culture influence perceptions of the environment and sustainability and how this has management implications for the uplands of the UK. He was also involved in coordinating a number of different research teams to develop system dynamics models that show how socio-economic and landscape factors interact to create vulnerability to climate change. Work on the implications of different types of landscapes for food security and other ecosystem services has been based on extensive collaboration with natural and social science colleagues and involved writing theoretical papers on how to formally combine natural and social sciences to understand these issues. The work on historic cases resulted in observations that in some, but not all situations, even small perturbations to the environment are enough to undermine food security. This has led to quantitative work on identifying characteristics of farming regions where harvests are more or less sensitive to climatic stresses. As well as numerous academic publications, Dr Fraser co-authored two books on food, sustainability and global environmental change: *Beef: the untold story of how milk, muscle and meat shaped the world*, and *Empires of Food: Feast, Famine and the Rise and Fall of Civilizations.*

RES-229-27-0001 Abigail Woods, Imperial College London
1 Sept 07 - 31 Jan 11
Reinventing the Wheel? Farm Health Planning 1942-2006

As part of this interdisciplinary fellowship, Dr Woods is exploring the history of animal disease prevention from 1942 onwards, in its economic, social, political and policy contexts, and relating her research to current policy discussions and the present-day science and practice of farm health planning. She is looking at the circumstances that gave rise to past initiatives, considering not just the science, but the social and political factors

that have influenced the way we react to outbreaks of animal disease. An understanding of these past initiatives should help us to avoid "reinventing the wheel" and the work will aim to produce some definite recommendations regarding future framing, implementation and evaluation of farm health planning.

The end of award report from the fellowship is due to be submitted in April 2011.

RES-229-27-0006 Dr Katy Appleton, University of East Anglia
1 Oct 08 - 30 Sept 11
The Development of Sustainable, Multi-Functional Landscapes in Rural Areas: A Case Study of a Norfolk Broads River Valley

This interdisciplinary fellowship examines the sustainability of different patterns of future recreational use of the Ant catchment of the Norfolk Broads. This research programme aims to develop and assess ways to deliver sustainable, multifunctional landscapes in rural areas, particularly those with significant pressures from tourism and recreation.

The planned questionnaire survey of recreational users of the study area was carried out in the summer of 2010, on both a face-to-face and online basis. Development of the technical methodology for the online survey took a little longer than anticipated but it was completed successfully and received a moderate number of responses. It was decided to proceed with analysis, obtain such results as possible, and write them up in conjunction with the overall survey methodology so as to be able to build on it with future research either in this study area or elsewhere. Analysis of the questionnaire data has been completed, with the results leading into the associated GIS analysis, which is almost complete. Due to the response rate on the survey, the GIS analysis has also drawn on existing literature on landscape preference, recreational activity and accessibility. Discussion has been initiated with Prof. Ian Bateman with regard to potential synergies between this work and the broader-scale assessment of recreational ecosystem services in the UK which is currently ongoing at UEA, and this will be pursued.

RES-229-27-0007 Dr Angela Cassidy, University of East Anglia
01 Oct 08 – 30 Sep 11
The Badger-TB Controversy: Expertise and Experience in Animal Disease Research

Dr Cassidy is investigating public controversy in the UK over transmission of bovine TB (bTB) between domestic cattle and wild badgers; and whether badgers should be culled to manage the disease. The research uses analyses of texts and qualitative interviewing to understand how contestation over the science and evidence of bTB in the public sphere of the mass media has shaped policy.

Findings show that dichotomised cultural framings of badgers have played a powerful role in the controversy, whereby on the one hand badgers are seen as charismatic wildlife to be preserved; and on the other as a potentially dangerous pest. These framings are strongly congruent with broader trends in the representation of animals that come into conflict with humans and greatly predate the bTB debate. In terms of policy impact, this suggests that

consideration of stakeholder, particularly farmer attitudes to badgers should encompass not only (for example) the biosecurity aspects of preventing TB transmission, but also the broader difficulties of living and working alongside these animals (e.g. crop damage; digging behaviour, etc.). The research reveals important differences in the agendas and roles of environmental and science journalists, who are often assumed to be broadly congruent in the academic literature. Unlike many public scientific controversies, media coverage of badger/bTB is divided along traditional left-right party political lines. The intensely political nature of the debate is underlined by its greater prominence in right-leaning national newspapers such as the *Telegraph*, which represent rural interests more strongly. While as a whole, press coverage of the issue has been very evenly balanced between pro and anti-badger culling opinion, the overall tone of badger/bTB coverage in each newspaper reflects its specific political orientation. Influential bodies can be seen to change their stances on the importance of 'evidence' in relation to bTB policy as the badger/bTB debate develops, and scientific findings emerge from the culling trials which ran counter to widespread expectations.

6. Key Performance Indicators

The Tables present the Key Performance Indicators for Year 7 of the Programme. All indicators and measures were satisfactorily achieved or exceeded.

Table 5: Performance Against KPIs, 2010

KPI	Programme Target/Measure	Director's Office Target/Measure	Statement of Achievement
1. Scientific Quality			
1.1 Intellectual leadership		To play a leading role in the development of the research field	The focus of intellectual leadership in 2010 was on: (a) preparation of a special profile of *Philosophical Transactions of the Royal Society* (Section 3.1); (b) leading a major launch event on the fourth wave of projects (Section 4.2); and (c) delivery of 14 keynote speeches (see Annex A)
1.2 Relu applications and awards	Over 17% EOA reports rated outstanding and less than 10% rated problematic[9]		PMG to report
1.3 Refereed journal articles	Number in 2010		43 articles were published in 2010 by ongoing projects (Annex B). The breakdown of ESRC's Research Catalogue means that we are unable to report fully on journal articles produced by all Relu projects in 2010.
1.4 Books/book chapters authored	Number in 2010		3 books and 4 book chapters were published by ongoing projects (Annex B).
1.5 Conference papers	Number in 2010		123 conference papers/presentations were given by Relu researchers, including 20 by the Director and Assistant Director (Annex B).
2. Interdisciplinarity			
2.1 To ensure that the Programme engages the wide range of disciplines within the natural and social sciences that can make important	To engage under-represented disciplines.	Progress interdisciplinary journal special issues	An interdisciplinary special profile of *Philosophical Transactions of the Royal Society* B was prepared during the year (see 3.1).

[9] These % figures reflect the current average evaluation grades under ESRC Programmes

contributions to its research			
2.2 Facilitation of inter-disciplinary training and advice opportunities		No specific training opportunities planned	Three data managing and sharing training workshops were organised by the Relu Data Support Service (3.4)
2.3 Number of disciplines engaged in Relu		Commentary on range and combination of disciplines involved under each call	A discipline analysis was prepared in an earlier reporting period.
3. User Engagement, Knowledge Transfer and Impact			
3.1 Meetings or events involving stakeholders		a) Launch event for Call IV projects; Workshop with EPSRC SUE programme; b) 2 meeting of Animal and Plant Disease Forum; c) Membership of forums and SAC d) Number of bilateral meetings with stakeholders e) Number conferences attended by Director or Assistant Director f) Number of presentations to stakeholders by Director and Assistant Director	a) Two major programme-wide events organised *Adapting Rural Living and Land Use to Environmental Change* (see 4.2), and *Strategic Land Use: Crossing the Urban Rural Divide: A Relu/SUE Workshop* (see 4.2), b) 2 meetings of Animal and Plant Disease Forum (Section 4.3) c) Forum membership steady (Section 4.3). PMG to report on SAC d) 15 bilateral meetings were held between the Director's Office and stakeholders (Annex A). e) 40 conferences were attended by the Relu Director's Office (Annex C). f) 13 presentations were given by the Director and Assistant Director to stakeholders (Annex A)
3.2 Links created between award holders and stakeholders		Commentary on actions taken to engage stakeholders with award holders.	Commentary provided in Section 4. See also Section 2.

3.3 Work shadowing and visiting fellowships		3 work shadows and 6 visiting fellowships set up and completed	2 work shadows and 23 visiting fellows set up or maintained (Section 4.4).
3.4 Informing public policy	To make a substantive Programme input (eg written or oral responses) to major relevant policy reviews/ consultations during the life of the Programme	Number of responses to policy reviews/ consultations	The programme contributed actively to land and water and animal and plant disease policy debates during 2010 (see Section 2 and 4). Highlights included submissions from across the programme to: the European Commission's consultation on CAP reform; the UK government's consultations on the Natural Environment White Paper and the Water White Paper; and the Select Committee on the Impact of CAP Reform on UK Agriculture. Individual projects made substantial inputs into several policy domains (Section 4.6).
3.5 Project Comms and Data Management Plans	To be completed 3 months after start of award	Oversee preparation of PCDMPs of 4th Call projects	8 PCDMPs have been prepared and signed off.
3.6 Media coverage of research and outputs		Number press releases issued	The Director's Office issued 8 press releases in 2010. Coverage of Relu research in national, local and trade media has continued to grow, with over 130 items recorded during the course of the year (see Annex B).
3.7 Reports or briefings produced for stakeholders		2 programme briefings and 10 policy and practice notes prepared and distributed	4 programme briefing papers were prepared and distributed, and 14 policy and practice notes (Section 4.1). 13 presentations were given specifically to stakeholders by the Director's Office.
3.8 Relu website		Director to maintain up to date website	The website was developed and updated regularly throughout 2010.
3.9 Relu Newsletter		4 newsletters prepared and distributed	4 newsletters were prepared and distributed to the Relu mailbase.
4. Research Capacity and Training			
4.1 Training workshop		No training workshops planned.	Three training workshops on data managing and sharing were organised by the Relu Data Support Service (3.4)

			and a CPD workshop was co-organised on CAP reform (4.3)
5. Data Collection and Management			
5.1 Data Support Service	Progress of Data Support Service		PMG to report
5.2 Deposition of Data	Project data deposited within 3 months of end of awards		PMG to report
6. Programme Management			
6.1 Commissioning	a) Assess and launch fourth call projects on *Adapting Rural Living and Land Use to Environmental Change*	a) Provide programme fit assessments b) Hold a launch event	a) Programme fit assessments given on 27 proposals b) Launch event held in July (see 4.2)
6.2 Applicants and Award holders		a) Provide telephone and email advice to applicants and award holders b) Hold planning meeting with call IV projects	a) Regular contact was maintained with all award holders through joint planning meetings, individual site visits and frequent e.mail correspondence advice. Meetings were conducted with 3 projects at which inter-project links and synergies were discussed. b) A group planning meeting was held with researchers and Principal Investigators from 9 Relu projects funded under the fourth call.
6.3 Annual Report		Prepare annual report for 2009, to include report on progress of projects.	Submitted to ESRC by Director's Office.
6.4 SAC Meetings	Number of meetings held		PMG to report
7. Added Value			
7.1 Support effective networking between project teams		Hold major launch event	Two major programme-wide events organised *Adapting Rural Living and Land Use to Environmental Change* (see 4.2), and *Strategic Land Use: Crossing the Urban Rural Divide: A Relu/SUE Worksho* (see 4.2), Additionally the Director's Office actively encouraged inter-project linkages (Section 3.7).

7. Forward Look

Our forward plans for 2011 are planned as follows:

1. Finalisation of a special journal issue on the management of animal and plant diseases
2. Co-organising a short course on catchment management
3. Organising a synthesis policy workshop on animal and plant diseases
4. Preparation of Relu Briefing Papers on animal and plant disease and the process lessons from the programme.
5. Preparation of policy and practice notes for individual projects and clusters of projects
6. Organisation of end of programme conference which will debate major questions about the future of the British countryside and showcase Relu innovations in science and methodology.

Table 6: Planned and potential activities and outputs for 2011

January	Relu Newsletter
February	Short course on catchment management
March	Annual Report 2011
April	Relu Newsletter
May	Policy workshop on management of animal and plant diseases
July	Relu Newsletter
	Relu Briefing paper on animal and plant disease
October	Relu Newsletter
November	Relu briefing paper on process lessons from Relu
	End of programme conference

8. Budget Matters and Co-funding

There are no matters of concern to report. Additional funding for RELU Phase IV on 'Adapting Rural Living and Land Use to Environmental Change' was provided by NERC and the Scottish Government during 2010.

ANNEX A: PROGRAMME CHRONOLOGY 2010

Month	Programme Events	Project Start/End Dates and Visits
Jan 10		
Feb 10	*Delivering ecosystem services through agricultural payments* Relu/SAGES seminar for Scottish policy advisers, Pentland House, Edinburgh	
	Third meeting of Relu Animal and Plant Disease Forum, London	
	Workshop for ESRC Investment Directors on the topic of *'Good Practice for Increasing Impact'*, Aston University, Birmingham.	
	Lesson Learning: Teleconference with Caroline Batchelor, EPSRC, to discuss joint Relu SUE workshop.	
	Teleconference with Alan Woods, Relu Land Use Policy Analyst.	
	Stakeholder meeting: Frances Rowe, One North East, Relu Fellow	
	Defra Workshop on "*UK Low Carbon Farming to 2050"*, Innovation Centre, Reading	
	Foresight Project Land Use Futures: Launch of Project Findings, Royal Society London	
	Anne Liddon Workshadowing at NFU	
Mar 10	Relu sponsored Northern Rural Network Seminar, Mickleton, Co. Durham *Future of the Uplands* included promotion of "*Drivers for Environmental Change"*, authored by Relu researchers	
	Stakeholder meeting: Third Relu/ Local Authorities Steering Group meeting, Newcastle	
	Stakeholder meeting: Alasdair Johnson, Defra, Newcastle	
	Defra workshop, London "Rural Transformations and Rural Policies in the UK and US"	
	"Understanding rural communities using social science data", Defra Innovation Centre, Reading. Commission for Rural Communities (CRC), the Rural Economy and Land Use programme (Relu) and the UK Data Archive (UKDA) seminar	
	Relu sponsored Northern Rural Network *CAP Reform Short Course*, Newcastle.	
	Meeting with Megan Power and Gareth Enticott to discuss plans for the Relu special Theme Issue of the Philosophical Transactions of the Royal Society	Meeting with Chris Quine and Norval Strachan to discuss joint workshop, Edinburgh
Apr 10	**Invited address:** Presentation on *"Why Social Scientists Should Engage with Natural Scientists: Lessons from a Major Interdisciplinary Research Programme in the UK"* Luigi Einaudi Lecture, Institute for European Studies, Cornell University, Ithaca, USA	
	Invited address: Presentation on *"Why Social Scientists Should Engage with Natural Scientists: Lessons from a Major Interdisciplinary Research Programme in the UK"* Penn State University, USA	

	Invited address: Presentation on *"The Creativity Claims of the Engaged Social Sciences: The Case of Rural Sociology in the US and Europe"* Development Sociology, Polson Institute, Cornell Center for Sustainable Future, Ithaca, USA	
	Invited address: Presentation on *"Vets in Transition: Changing professional identities in the UK and US"* Cornell University Veterinary School, Ithaca, USA	
	Invited address: Presentation on *"Vets in Transition: Changing professional identities in the UK and US"* University of Wisconsin, Madison	
	Fourth Call Relu Assessment Panel, Medical Research Centre	
May 10	ESRC Peer Review College, Leeds University	End date project RES-227-25-0006 The Effects of Scale in Organic Agriculture (Stagl), Sussex
	Defra social research evidence review workshop	
	Stakeholder meeting: Jonathan Fisher, Environment Agency, London	
	Food and Environment Research Agency Workshop on *"Responsibility and Cost Sharing"* FERA, York	
	Stakeholder meeting: Fourth Relu/ Local Authorities Steering Group meeting, Newcastle	
	Marine Fisheries Science Advisory Group meeting, Defra, London	
	Lesson Learning: Meeting with Caroline Batchelor, EPSRC, to discuss Relu/SUE collaboration, Newcastle.	
	Relu workshop *Bovine Tuberculosis: Hosts, Pathogens and Environments*, Warwick HRI.	
	Relu workshop *Regulating plant diseases; the role of stakeholders in governance?* London	
Jun 10	Presentation to Chinese rural economics delegation from Beijing, Newcastle upon Tyne	Start date project RES240-25-0004 Building Adaptive Strategies for Environmental Change in River Catchments (Pain), Durham
	Lesson learning: Meeting with Ken O'Callaghan and Ruth Welters, LWEC, Newcastle	End date project RES-227-25-0018 Understanding Environmental Knowledge Controversies (Whatmore), Oxford
	Lesson learning: LWEC Workshop on *"Using Placements in Knowledge Exchange"*, Defra, London. Presentation on *"The contribution of placement fellowships to knowledge exchange: a Relu perspective"*	
	Invited address: Presentation on *"Copying or subverting American models: the foundation of European Rural Sociology",* Wageningen, Netherlands.	
	International Advisory Board (IAB) for the Evaluation of the Wageningen Institute for Environment and Climate Research (WIMEK)	
	Stakeholder meeting: Jeremy Blackburn, Commission for Rural Communities, Newcastle	
	Review of Defra Rural Research, London	
	Stakeholder meeting: Bob Harris, Defra, Newcastle	
	ESRC Peer Review Collge meeting, London	
Jul 10	UK China Sustainable Agriculture Innovation Network	Start date project RES240-25-0006 Linking

	(SAIN**)** Advisory Board, London	Evidence and Policy for Managing Biodiversity in the Agricultural Landscape (Sutherland), Cambridge
	Natural England, Science Advisory Council, London	Start date project RES240-25-0016 Managing Environmental Change at the Rural-Urban Fringe (Scott), Birmingham
	Adapting Rural Living and Land Use to Environmental Change: Launch event of Relu 4th Wave Projects, Manchester. Presentation on *"The rural model of knowledge exchange"*	Fourth Call PIs Planning meeting, Manchester
	Teleconference with ESRC (Jacky Clake, Fiona Armstrong, Danielle Moore) to discuss Impact Toolkit	
Aug 10	**Stakeholder meeting:** Nicola Lloyd, Commission for Rural Communities, to discuss the implications of Relu for rural policy	Start date project RES 240-25-0020 Flood Management in Borderlands (Oughton), Newcastle
	Stakeholder meeting: Peter Costigan, Defra, to discuss the implications of Relu for Defra science policy, London.	End date project RES-229-25-0005 Lessons from Dutch Elm Disease in Assessing the Threat from Sudden Oak Death (Potter), Imperial College London
	Stakeholder meeting: Peter Stevenson, Defra, to discuss the implications of Relu for animal disease policy, London.	
Sept 10	**Lesson learning:** Meeting with Catherine Lyall and Wendy Marsden to discuss experience of Relu interdisciplinarity as part of QUEST review, Newcastle	End date project RES-229-25-0022 Energy Production on Farms through Anaerobic Digestion (Banks), Southampton
	RERAD Strategy Research Programmes 2011-2016: Chairing Panel Review of Tenders	Meeting with Mark Reed to discuss Relu book, Newcastle
	Contribution of the Livestock Sector on the Environment and Society, BIS Conference Centre, London	
	Lesson learning: Telephone interview with Emily Pearman, NERC Knowledge Exchange Team, to discuss development of Water KE programme and lessons from Relu.	
	Lesson learning: Meeting with Ruth Welters to discuss Relu/LWEC communication links, UEA	
	Invited address: Government Veterinary Service Conference, "Veterinary Education: A Global Perspective" Presentation on *"Vets in Transition: changing professional identities in the UK and US*", Warwick	
	Invited address: IUCN UK Peatland Programme Conference, Durham University. Presentation on *"Telling stories: knowledge exchange across science, policy and practice"*	
	Invited address: Scientific Advisory Board, Finnish Agri-Food Institute, Kirkkonummi Finland. Presentation on *"Stakeholder Engagement and Research Planning: Lessons from a Major Interdisciplinary Research Programme"*	
	Relu end of project conference *"Integrated systems for farm diversification into energy production by anaerobic digestion"* University of Reading	
Oct 10	**Invited address:** Presentation on "*The Lowe Report: One Year On*", British Cattle Veterinary Association	Start date project RES 240-25-0009 Sustainable Cultivation of Upland

	Annual Conference, Torquay	Environments (Harvey), Newcastle
	Invited address: Presentation on *"Rural policy and expertise"*, Countryside and Community Research Institute Annual Conference, Cheltenham	Start date project RES 240-25-0012 Sustainable Uplands: Transforming knowledge for Upland Change (Reed), Aberdeen
	Fourth meeting of Relu Animal and Plant Disease Forum, London	Start date project RES 240-25-0018 Market-Based Mechanisms for Protection of Water Resources (Smith), Wye College
	Project Practitioner Panel for *"Assessing and Communicating Animal Disease Risks for Countryside Users", Birmingham*	Start date project RES 240-25-0019 Collaborative Conservation in Agri-Environment Schemes (Franks), Newcastle
	Project workshop *"Policy and disease containment strategies in Cryptosporidium: Living with uncertainty"* UKWIR, London	End date project RES-229-25-0016 The Governance of Livestock Disease (Medley), Warwick
	Relu/ EPSRC Sustainable Urban Environment workshop, "Strategic Land Use: Crossing the Urban Rural Divide", London. Presentations on "*Relu: a Rural Land Use Interdisciplinary Programme*" and "*Knowledge Exchange in Relu*"	End date project RES-227-25-0024 Modelling the Impacts of the Water Framework Directive (Bateman), UEA
	Project workshop **"**Sustainable Uplands: how can policy address an uncertain future for UK uplands?**",** *London*	
Nov 10	*"An Invitation to Shape the Nature of England"* Natural Environment White Paper Workshop – Defra, Birmingham.	End date project RES-229-25-0007 Assessing and Communicating Animal Disease Risks for Countryside Users (Quine), Forest Research
	Lesson learning: Presentation to Programme Board of Global Food Security programme on experience of Relu interdisciplinarity	
	Lesson learning: Meeting with Adam Vanbergen, Insect Pollinator Initiative, to discuss Relu experience of interdisciplinary working, Newcastle	
	Lesson learning: Meeting with Sir John Beddington, Government Chief Scientist, to discuss lessons from Relu, London	
	NERC Knowledge Exchange Network meeting, Leeds	
	Stakeholder meeting: Fifth Relu/ Local Authorities Steering Group meeting, Newcastle	
	Invited address: Presentation on *"Why Social Scientists should engage with Natural Scientists"*, Aberdeen Centre for Environmental Sustainability, University of Aberdeen	
	Invited address: Presentation on *"Rural Policy and Expertise"*, Macaulay Land Use Research Institute, Aberdeen	
	Invited address: Presentation on *"Why Social Scientists should engage with Natural Scientists: the Land Use Challenge"*, LYNET Conference, Espoo, Finland	
	Relu conference on *"Risk and uncertainty in the context of animal and zoonotic disease management"*, York.	
	Relu end of project conference "*Catchment management for protection of water resources"*, University of London	
	Relu SAC	
Dec 10	Relu end of project conference *"New forms of*	Start date project RES 240-25-0025 Rural

	participatory environmental governance: experiences and challenges from Loweswater, Cumbria", Penrith	Communities Adapting and Living with Climate Change (Phillips), Leicester
	LGA Rural Policy Review Group, London	End date project RES-229-25-0008 Testing a Community Approach to Catchment Management (Waterton), Lancaster
	AHRC Steering Group meeting, London	End date project RES-229-25-0009 Catchment Management for Protection of Water Resources (Smith), Wye College
	Stakeholder meeting: Meeting with Jeremy Blackburn, Relu Visiting Fellow, Newcastle	
	Stakeholder meeting: Meeting with Dirk Pardoel, Relu Visiting Fellow, Newcastle	
	RVC Seminar "*Economics of animal health and production",* London	
	Stakeholder meeting: Meeting with Ken Clarke, Relu Visiting Fellow, Newcastle	
	Loweswater Care Project Meeting, Penrith	
	Teleconference with Paul Rouse and Owen Dowsett, ESRC	

Annex B: PUBLICATIONS DURING THE YEAR[10]

Type of Publication	Outputs in 2010 from Ongoing Projects
Journal Articles	43
Books and Special Issues	3
Book chapters	4
Briefing papers, working papers	26
Conference papers/presentations	123
Press releases	12

EXAMPLES OF JOURNAL ARTICLES AND SPECIAL ISSUES

Bateman, I.J. (2010) Bringing the real world into economic analyses of land use value: Incorporating spatial complexity, *Land Use Policy*, 26, 1, S30-S42.

Bowes, M.J., Neal, C., Jarvie, H.P., Smith, J.T. and Davies, H.N. (2010) Predicting phosphorus concentrations in British rivers resulting from the introduction of improved phosphorus removal from sewage effluent. *Science of the Total Environment*, 408, 19, 4239–4250.

Carrasco, L.R., Mumford, J.D., MacLeod, A., Harwood, T., Grabenweger, G., Leach, A.W., Knight, J.D. and and Baker, R.H.A. (2010) Unveiling human-assisted dispersal mechanisms in invasive alien insects: integration of spatial stochastic simulation and phenology models *Ecological Modelling* 221, 2068-2075.

Carrasco, LR, Harwood, T.D., Toepfer, S., MacLeod, A., Levay, N., Kiss, J., Baker, R.H.A., Mumford, J.D. and Knight, J.D. (2010) Dispersal kernels of the invasive alien western corn rootworm and the effectiveness of buffer zones in eradication programmes in Europe *Ann. Appl. Biol.* 156, 63–77.

Challinor, A. Simelton, E., Fraser, E.D.G., Hemming, D. and Collins, M. (2010) Increased crop failure due to climate change: assessing adaptation options using models and socio-economic data for wheat in China *Environmental Research Letters* 5(3), 1-8.

Day, B. H. and Pinto Prades, J.L. (2010). Ordering anomalies in choice experiments, *Journal of Environmental Economics and Management*, 59, 271–285.

Dougill, A., Fraser, E.D.G. and Reed, M. (2010) Anticipating vulnerability in dryland pastoral systems: using dynamic systems models for the Kalahari of southern Botswana *Ecology and Society* 15(2), 17.

Fezzi, C., Hutchins, M., Rigby, D., Bateman, I., Posen, P. and Hadley, D. (2010) Integrated assessment of Water Framework Directive nitrate reduction measures, *Agricultural Economics*, 41, 123-134.

Fish, R.D., Winter, M., Oliver, D.M., Chadwick, D.R., Selfa, T., Heathwaite, A.L. and Hodgson, C. J. (2009) Unruly pathogens: eliciting values for environmental risk in the context of heterogeneous expert knowledge *Environmental Science and Policy* 12, 281-296.

Grant, W. (2009) Intractable Policy Failure: The Case of Bovine TB and Badgers *British Journal of Politics and International Relations* 11, 557-553.

Hampson, D.I., Crowther, J., Bateman, I.J., Kay, D., Posen, P., Stapleton, C.M., Wyer, M.D., Fezzi, C., Jones, P. and Tzanopoulos, J. (2010) Predicting microbial pollution

[10] The breakdown of ESRC's Research Catalogue means that we are unable to report fully on publications produced by all Relu projects in 2010.

concentrations in UK rivers in response to land use change. *Water Research*. 44, 16, 4748-4759.
Harwood, T.D. (2009) Fuzzy reasoning and unacceptable change: defining and assessing an ambiguous endpoint: Response to Wilkinson & Tepfer's "Fitness and beyond: preparing for the arrival of GM crops with ecologically important novel characters" *Environ. Biosafety Res.* 8, 15–16.
Harwood, T.D. (2009) The circular definition of populations and its implication for biological sampling *Molecular Ecology* 18(5), 765-768.
Hodgson, C.J., Bulmer, N., Chadwick, D.R., Oliver, D.M., Heathwaite, A.L., Fish, R.D. and Winter, M. (2009) Establishing relative release kinetics of faecal indicator organisms from different faecal matrices *Letters in Applied Microbiology* 49, 124-130.
Hutchins, M.G., Deflandre-Vlandas, A., Posen, P.E., Davies, H.N. and Neal, C. (2010) How do river nitrate concentrations respond to changes in land-use? A modelling case-study of headwaters in the River Derwent catchment, North Yorkshire, UK. *Environmental Modelling and Assessment*, 15, 2, 93-109.
Hutchins, M.G., Johnson, A.C., Deflandre-Vlandas, A., Comber, S., Posen, P. and Boorman, D. (2010) Which offers more scope to suppress river phytoplankton blooms: Reducing nutrient pollution or riparian shading? *Science of the Total Environment*, 408, 5065-5077.
Liddon, A. (2010) Ecosystem services and land use: a synoptic approach *Geography Review* 24(2) 36-39.
Lowe, P. and Phillipson, J. (2010) A response to Evans and Marvin. Letter to the Editor *Environment and Planning* 42, 3041-3042.
Neal, C., Jarvie, H.P., Williams, R. J., Love, A., Neal, M., Wickham, H., Harman, S. and Armstrong, L. (2010) Declines in phosphorus concentration in the upper River Thames (UK): links to sewage effluent cleanup and extended end member mixing analysis. *The Science of the Total Environment*, 408, 6, 1315-1330.
Neal, C., Williams, R. J., Bowes, M.J., Harrass, M.C., Neal, M., Rowland, P., Wickham, H., Thacker, S., Harman, S., Vincent, C. and Jarvie, H.P. (2010) Decreasing boron concentrations in UK rivers: insights into reductions in detergent formulations since the 1990s and within-catchment storage issues. *The Science of the Total Environment*, 408, 6, 1374-1385.
Odoni N. and S.N. Lane (2010) Knowledge-theoretic models in hydrology. *Progress in Physical Geography*, 34/2, 151-171
Oliver, D.M., Heathwaite, A L., Fish, R.D., Chadwick, D.R., Hodgson, C.J., Winter, M., and Butler A. (2009). Scale appropriate modelling of diffuse microbial pollution from agriculture *Progress in Physical Geography* 33, 358-377.
Oliver, D.M., Page, T., Hodgson, C.J., Heathwaite, A.L., Chadwick, D.R., Fish, R.D. and Winter, M. (2010) Development and testing of a risk indexing framework to determine field-scale critical source areas of faecal bacteria on grassland *Environmental Modelling and Software* 25, 503-512.
Quinn, C., Fraser, E.D.G., Hubacek, K. and Reed, M. (2010) Property rights in UK uplands and the implications for policy and management *Ecological Economics* 69, 1355-1361.
Reed, M., Bonn, A., Slee, W.,Beharry-Borg, N., Birch, J. Brown, I., Burt, T., Chapman, D., Chapman, P., Clay, G., Cornelli, S., Fraser, E.D.G., Glass, J., Holden, J., Hodgson, J.,

Hubacek, K., Irvine, B., Jin, N., Kirkby, M., Kunin, W., Moore, O., Moseley, D., Prell, C., Pricej, M., Quinn, C., Redpath, S., Reid, C., Stagl, S., Stringer, S., Termansen, M., Thorp, S., Towers, S., and Worrall, F. (2010) The Future of the Uplands *Land Use Policy* 26 (2) S204-S216.

Rincon, B., Banks, C.J. and Heaven, S. (2010) Biochemical methane potential of winter wheat (Triticum aestivum L.): Influence of growth stage and storage practice, *Bioresource Technology* 10 (21), 8179-8184.

Tomlinson, I. and Potter, C, (2010) 'Too little, too late'? Science, policy and Dutch Elm Disease in the UK *Journal of Historical Geography* 36, 121-131.

EXAMPPLES OF BOOKS AND BOOK CHAPTERS

Bailey, A., Chandler, D., Grant, W.P., Greaves, J., Prince, G. and Tatchell, M. (2010) *Biopesticides: Pest Management and Regulation* published. CABI

Bateman, I.J. and Georgiou, S. (2010). The Socioeconomic Consequences and Management of Climate Change Impacts on Water Resources, in George, D.G., (ed.) *The Impact of Climate Change on European Lakes*, Springer, Amsterdam.

Davies, A.L. (2010) Late Holocene vegetation and land-use diversity in NW Sutherland: a fine resolution palaeoecological perspective, in *The Quaternary of the far NW Scottish Highlands Field Guide*, Lucas, S. & Bradwell, T. (eds.), Quaternary Research Association, London, 87-100.

Fraser, E. and Rimas, A. (2010) *Empires of Food: Feast, Famine and the Rise and fall of Civilisation*, Random House

Lanz, B., Provins, A., Bateman, I.J., Scarpa, R., Willis, K.G. and Ozdemiroglu, E. (2010). Investigating willingness to pay – willingness to accept asymmetry in choice experiments, in Hess, S. and Daly, A. (eds.) *Choice Modelling: the State of the Art and the State of Practice - Proceedings from the Inaugural International Choice Modelling Conference*, Emerald, Bradford.

PRESS AND PUBLICITY 2010

January	Relu Newsletter	
	Farmers' Weekly interactive	http://www.fwi.co.uk/community/forums/what-is-land-for-42290.aspx thread discussing *"What is Land for*?" 11 January onward
	CLA web news	*Rural Economy and Land Use Programme - Landmarks for Policy* January 2010 www.cla.org.uk/In_Your_Area/North_East/...//1000883.htm/
	RuSource briefing	*What is Land for?* 6 January book edited by M Winter and Matt Lobley http://www.arthurrankcentre.org.uk/projects/rusource_briefings/rus10/956.pdf
	RuSource briefing	*Carbon labelling for overseas vegetables?* Edwards-Jones P&P note 13 January 2010 http://www.arthurrankcentre.org.uk/projects/rusource_briefings/rus10/964.pdf
	Eg Magazine climate change and sustainability	*Landmarks for Policy – how Relu programme might feed into policy making* 18 January 2010 http://www.egemagazine.com/articles/20100118_13

	RuSource briefing	*Landmarks for policy* quotes from Landmarks briefing paper 20 January 2010 http://www.arthurrankcentre.org.uk/projects/rusource_briefings/rus10/968.pdf
	BBC Radio 4	*You and Yours* item on flooding in Pickering and Whatmore research 27 January 2010 http://www.bbc.co.uk/radio4/youandyours/
	Farmers' Weekly	*Should Defra rule by the heart or by the head?* Talking point article by Katy Wilkinson p 29, 29 January 2010
	Town and Country Planning	*Regional rural land use – a time for fresh thinking?* Article by Frances Rowe (Relu visiting fellow) p 28-31 January 2010
February	RICS Land Journal	*Time for fresh thinking?* By Frances Rowe (Relu visiting fellow writing on land use planning and citing Relu projects) p 9-10 Feb/March 2010
	Veterinary Record	*A public or private profession?* Viewpoint article by Philip Lowe p 211-212, And editorial comment *Carving out a role in food production* p 184 13 February 2010
	The Ecologist	*'Old environmentalists' are challenging an obsession with land productivity* What is Land book 11 February 2010 http://www.theecologist.org/blogs_and_comments/commentators/other_comments/414340/old_environmentalists_are_*challenging_an_obsession_with_land_productivity.html*
	Vetontheweb.co.uk	*Dwindling vet influence threatens food safety* 12 February 2010 http://www.vetontheweb.co.uk/vet-story-detail.asp?id=129 report on Philip Lowe Vet Record comment article
	Daily Telegraph	*Vets no longer like James Herriot* http://www.telegraph.co.uk/earth/earthnews/7222497/Vets-no-longer-like-James-Herriot.html 13 February 2010 report on Philip Lowe Vet Record comment article
	Inthenews.co.uk news site	*Uk food safety threatened by dwindling vet influence* 13 February 2010 http://www.inthenews.co.uk/news/quirky/uk/uk-food-safety-threatened-by-dwindling-vet-influence--$1359801.htm report on Philip Lowe Vet Record comment article
	Flutrackers.com news blogging site	*Diminishing Vet Influence Threatens UK Food Safety* 14 February 2010 http://www.flutrackers.com/forum/showthread.php?t=141214 report on Philip Lowe Vet Record comment article
	Medindia.net news site	*Diminishing vet influence threatens UK food safety* http://www.medindia.net/news/Diminishing-Vet-Influence-Threatens-UK-Food-Safety-65026-1.htm 14 February 2010 report on Philip Lowe Vet Record comment article
	Caledonian Mercury	*Pampered pets blamed for food safety risk* http://health.caledonianmercury.com/2010/02/13/pampered-pets-vets-blamed-for-food-safety-risk/00198 14 February 2010 report on Philip Lowe Vet Record comment article

	Newcastle Journal	*Professor claims vets treating pets causes food threat* 15 February 2010 http://www.journallive.co.uk/north-east-news/environment-news/2010/02/15/professor-claims-vets-treating-pets-causes-food-threat-61634-25834298/2/ report on Philip Lowe Vet Record comment article
	Northern Echo	*Vets spend too much time treating pets* 15 February 2010 http://www.thenorthernecho.co.uk/news/5006524._Vets_spend_too_much_time_treating_pets_/ report on Philip Lowe Vet Record comment article
	UKnetguide	*British food safety 'being threatened by dwindling vet influence* 15 February 2010 http://www.uknetguide.co.uk/Latest-News/British-food-safety-being-threatened-by-dwindling-vet-influence-19612938.html
	BigonSandbank news site	*British food safety being threatened by dwindling vet influence* 15 February 2010 http://bigonsandbank.com/blog/british-food-safety-being-threatened-by-dwindling-vet-influence/ report on Philip Lowe Vet Record comment article
	Barfblog.com	Shortage of food animal veterinarians puts our food supply at risk 15 February 2010 article on US perspective quoting Lowe article http://barfblog.com/blog/category/animal-welfare
	Medicalnewstoday.com	*Dwindling Vet Influence Threatens UK Food Safety* 15 February 2010 http://www.medicalnewstoday.com/articles/179175.php report on Philip Lowe Vet Record comment article
	Vetclick.com	*Dwindling Vet Influence Threatens UK Food Safety* 15 February 2010 http://www.vetclick.com/news/view_article.php?ArticleId=858 report on Philip Lowe Vet Record comment article
	Netdoctor.co.uk	*British food safety threatened by dwindling influence of vets* 15 February 2010 http://www.netdoctor.co.uk/interactive/news/theme_news_detail.php?id=19614998&tab_id=132 report on Philip Lowe Vet Record comment article
	Pet Product Marketing	*Pets more lucrative patients to work with* 15 Feb 2010 http://www.petproductmarketing.co.uk/content.php?sid=216 report on Philip Lowe Vet Record comment article
	Vetpro.co.uk	*Dwindling vet influence threatens UK food safety* 16 Feb 2010 http://www.vetpro.co.uk/modules.php?name=News&file=article&sid=769 report on Philip Lowe Vet Record comment article
	Vetpulse.tv	*Financial carrots to restore the Herriot factor?* 16 Feb 2010 http://www.vetpulse.tv/blog/757_financial-carrots-to-restore-the-herriot-factor response to Philip Lowe Vet Record comment article
	Moneyweek	*Profit from Britain's animal lovers* http://www.moneyweek.com/investment-advice/profit-from-our-penchant-for-pets-47410.aspx# *19 February 2010* quoting Daily Telegraph article on Philip Lowe comment piece
	VetMedresource	Dwindling Veterinary Influence Threatens UK Food Safety http://www.cabi.org/vetmedresource/ February 2010 report on Philip Lowe Vet Record comment article

	Bioscience and Technology	*Taking back the high ground* http://biosciencetechnology.com/News/Feeds/2010/02/sections-international-news-taking-back-the-high-ground/ 25 February 2010 Hubacek policy and practice note
	Yorkshire Post	*Farmers 'should be paid to protect our hills'* http://www.yorkshirepost.co.uk/news/Farmers-39should-be-paid-to.6107761.jp 26 February 2010 Hubacek policy and practice note
	The Scotsman	*Call to pay farmers for managing uplands* http://thescotsman.scotsman.com/aberdeen/Call-to-pay-farmers-for.6109822.jp 27 February 2010 Hubacek policy and practice note
	Press and Journal	*Better targeting of hill aid urged* http://www.pressandjournal.co.uk/Article.aspx/1624559?UserKey= 27 February 2010 Hubacek policy and practice note
	NFU on-line	Reports on NFU conference by Anne Liddon http://www.nfuonline.com/News/NFU-Conference-2010/News-and-programme/Tough-questions-on-the-uplands-at-breakfast/ http://www.nfuonline.com/News/NFU-Conference-2010/News-and-programme/NFU-Conference---meat,-McCartney-and-Mackintosh/ http://www.nfuonline.com/News/NFU-Conference-2010/News-and-programme/Is-high-welfare-always-high-cost-/
	Relu blog	Anne Liddon's blog from the NFU conference http://www.roamingrelu.blogspot.com/
March	BBC Radio 4	*Farming Today* 2 March 2010 Flooding item on Morris research http://www.bbc.co.uk/programmes/b006qj8q
	BBC Radio 4	*Costing the Earth* 29 March 2010 Ian Bateman interview
	RuSource briefing	*994 Disease Policy* March briefing Relu P&P note 16 4 March 2010
	RuSource Briefing	*995 Uplands Policy* March briefing Relu P&P note 14 4 March 2010
	Society Now	Spring 2010 Issue 6 *Action needed on crop pests* p3 *Better schemes for the uplands* p7 *Welsh schools welcome bug man* p31
	RuSource briefing	999: Integrated management of floodplains Relu P&P note no 15 1 March 2010
	Town and Country Planning bulletin	*Countryside land management could play an increasingly important role in flood planning in the future* 18 March 2010 Relu policy and practice note
	Yorkshire Post	*Joseph Holden: Sharing ideas will shape future of our uplands* 22 March 2010 opinion piece http://www.yorkshirepost.co.uk/opinion/Joseph-Holden-Sharing-ideas-

		will.6146525.jp
April	Relu Newsletter	
	Rural Matters RASE magazine	*Responsibility and Cost Sharing – at what price?* Article by Katy Wilkinson spring issue p 20
	BBC Radio 4	*Costing the Earth* interview with Ian Bateman about costing of ecosystem services for National Ecosystem Assessment 9 pm 7th April 2010 http://www.bbc.co.uk/iplayer/episode/b00rtcvw/Costing_the_Earth_07_04_2010/
	Farmers' Weekly	*An increasing role in the nation's diet* opinion piece by Adam Bedford referencing Relu project – Implications of a Nutrition Driven Policy for the Countryside p 28
	Sunday Times	*Environment, sustainability and the food supply challenge* supplement 18 April 2010 p 58/50 quoting Gareth Edwards-Jones and the Relu programme http://www.climatechangeandthefoodsupplychallenge.com/
	British Farmer and Grower	*Short rotation coppice – a CFE voluntary measure* article by Natural England's Peter Hayman mentioning Angela Karp's biofuels project April 2010
	MacLeans Magazine	*Summer Reading List* citing Relu interdisciplinary fellow Evan Fraser's book "Empires of Food" 24 April 2010 http://www2.macleans.ca/2010/04/22/the-reading-list/
May	BBC 1 TV	*Countryfile* 3 May 2010 Gareth Edwards Jones interviewed about comparisons of carbon footprints of home grown and imported fruit and vegetables http://www.bbc.co.uk/iplayer/episode/b00sbj9w/Countryfile_03_05_2010/
	The Times	*Why organic farms do not attract the birds – or bees* p17 5 May 2010 – article on Sigrid Stagl project http://timesonline.co.uk/tol/news/environment/article7116158.ece
	Biosciencetechnology.com	*Organic farming shows limited benefit to wildlife* 5 May 2010 http://www.biosciencetechnology.com/News/Feeds/2010/05/sections-academia-news-organic-farming-shows-limited-benefit-to-wildlife/
	Daily Mail	*Organic farms produce half food of conventional ones* 5 May 2010 http://www.dailymail.co.uk/sciencetech/article-1272838/Organic-farms-produce-HALF-food-conventional-ones.html?ito=feeds-newsxml#
	RTPI Rural Planning Network Bulletin	*What's the future for our hills?* Policy and Practice note 17, 6 May 2010 http://www.rtpi.org.uk/item/3656
	The Times	*Organic farms do benefit biodiversity* letter from Bruce Pearce re 5 May article 7 May 2010 http://www.timesonline.co.uk/tol/comment/letters/article7118420.ece

	RTPI bulletin	*Deer provide pointers on managing natural resources* Relu P&P note http://www.rtpi.org.uk/item/3729 20 May 2010
	RuSource Briefing	*Bovine Tuberculosis: people, politics and culture* report on bovine TB seminars 20 May 2010
	BBSRC food security blog	*Green pesticides and a greener revolution* Blog from Relu researcher Wyn Grant http://www.foodsecurity.ac.uk/blog/index.php/2010/05/green-pesticides-greener-revolution/ 17 May 2010
	Veterinary Record	*Improving Farm Veterinary Services* viewpoint article from Nottingham University commenting on Lowe report *22 May 2010*
	RuSource Briefing	*Knowledge Exchange* briefing on "Telling Stories" 27 May 2010
June	Globe and Mail:	*Eat up we may soon witness decline of the food empire* item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food" http://www.theglobeandmail.com/life/food-and-wine/eat-up-we-may-soon-witness-the-decline-and-fall-of-a-food-empire/article1609951/ 10 June 2010
	BBC Radio Scotland	Mark Reed interviewed on BBC Radio Scotland newsbulletins following CRC report on the uplands (input from Hubacek project) 15 June 2010
	Op-Ed on-line	"The New Gluttony" http://www.psychologytoday.com/blog/the-considered-table/201006/the-new-gluttony 17n June 2010 item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food"
	BBC Radio 4	*Farming Today* item on CO2 storage in peat featuring Moors for the Future interviewee and covering work from Hubacek project 17 June 2010 http://www.bbc.co.uk/programmes/b00snl60
	MacLeans Magazine	Review of Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food" 24 June 2010 http://www2.macleans.ca/2010/06/24/the-race-to-the-deepest-place/
	Op-Ed on-line	"The problem of food and the free market" 24 June 2010 http://www.psychologytoday.com/blog/the-considered-table/201006/the-problem-food-and-the-free-market item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food"
	Aberdeen Evening Express	*Warning over countryside infection bug* article on E coli research 28 June 2010
	STV	*STV News North* - 28 June 2010 Presenter: Laura Goodwin, New research has found that two thirds of visitors to the countryside have never heard of the deadly E coli 0157 bug.
	Physorg.com on line news	28 June 2010 Tourists are putting themselves at risk of E. coli O157 infection E coli research

	Walesonline.com	28 June 2010 Visitors to the countryside ignorant of E.coli danger E coli research
	NRP US Radio	The Journey Home http://diegoradio.com/?m=201006 *Show* item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food" 28 June 2010
	The Scotsman	*Widespread ignorance of E coli bug disease risk* 29 June 2010 http://news.scotsman.com/scotland/Widespread-ignorance-of-E-coli.6388378.jp
	BBC Radio 4	Interview with Prysor Williams on *Farming Today* about E coli research 29 June 2010 http://www.bbc.co.uk/programmes/b00st9q0#synopsis
	Press and Journal	*Most rural visitors have never heard of killer bug, study finds* article and editorial on E coli research 29 June 2010
	NorthSound 2	*NorthSound News* - 29 June 2010 E coli research and interview with Colette Jones
	Original 106 FM	*Original 106 FM News* - 29 June 2010 e coli research
	BBC Radio Aberdeen	*BBC North East News* - 29 June 2010 E coli research Dr Colette Jones, University of Aberdeen, comment.
	BBC Radio Cymru	Interview about E coli research with Prysor Williams on *Byd Amaeth ("Farming World")* 29 June 2010 http://www.bbc.co.uk/iplayer/cy/episode/b00swk0d/Lisa_Gwilym_29_06_2010/
July	Relu Newsletter	
	NPR US Radio	*The Takeaway* item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food" 7 July 2010 http://www.thetakeaway.org/2010/jul/07/dangers-empires-food/
	Vancouver Sun	*Local organic food: An answer or a sure path to disaster?* item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food" 7 July 2010 http://www.vancouversun.com/sports/Local+organic+food+answer+sure+path+disaster/3230713/story.html#ixzz0tfADEW00http://www.vancouversun.com/sports/Local+organic+food+answer+sure+path+disaster/3230713/story.html
	NPR US Radio	*Leonard Lopante Show* item on Relu Interdisciplinary Fellow Evan Fraser's book "Empires of Food" 8 July 2010 http://beta.wnyc.org/shows/lopate/2010/jul/08/empires-food/
	RuSource briefing	Briefing 1075: Implementing the Water Framework Directive 8 July 2010

	Catchment Change Network website	Water Framework Directive – Relu briefing paper http://www.catchmentchange.net/news/water-frameworkimplementing-the-water-framework-directive
	Radio York	10 min interview with Mike Potter (member of Ryedale Flood Group) 7.35 am, about proposal for bunds to alleviate flooding in Pickering following Whatmore project, with details about project and flood modelling http://www.bbc.co.uk/iplayer/radio/bbc_radio_york
August	Mother and Baby magazine	*Stay safe on the farm* article on E coli risk quoting Colette Jones from Strachan project p17 August 2010
	Farmers' Guardian	*Breaking the vicious circle* opinion piece by Wyn Grant on bTB p 9 Friday 27 August 2010
September	Farmers' Guardian	*Human TB risk* letter responding to Wyn Grant article p 8 Friday September 3 2010
	Science Daily news site	*Fences could help clean up watercourses* http://www.sciencedaily.com/releases/2010/09/100920081324.htm 20 September 2010
	Bizface newssite	*Fences could help clean up watercourses* 20 September 2010 http://www.bizface.co.uk/bizfaceforum/science-news/59910-fences-could-help-clean-up-watercourses.html
	Regator blogging site	*Fences could help clean up watercourses* 20 September 2010 http://regator.com/p/244703173/fences_could_help_clean_up_watercourses/
	Treehugger ecology news site	*Fences could help clean up watercourses* 20 September 2010 http://topics.treehugger.com/article/0dhG8ny5EF0Wi
	Newscell news site	*Fences could help clean up watercourses* 20 September 2010 http://news.cell.com/story.php?title=fences-could-help-clean-up-watercourses
	Habitat news site	*Fences could help clean up watercourses* 20 September 2010 http://www.habitat.org.uk/news1.htm
	Food Security website	*Fences could help clean up watercourses* 20 September 2010 http://www.foodsecurity.ac.uk /
	RuSource Briefing	Briefing 1131: *Fences could help clean up watercourses* 23 September 2010
	Humboldbaykeeper website	*Fences could help clean up watercourses* 20 September 2010 http://www.humboldtbaykeeper.org/the-news/263-fences-could-help-clean-up-watercourses.html
	Facebook Science Communication	*Fences could help clean up watercourses* 20 September 2010 http://www.facebook.com/pages/Science-Communication-International/184382211740

	Recycle website	*Fences could help clean up watercourses* 20 September 2010 http://www.recyclerebuildreuse.com/?p=20555
	Innovateuk news websblog	*Fences to clean up watercourses* 24 September 2010 https://ktn.innovateuk.org/web/anne-miller/blogs/-/blogs/1541345;jsessionid=FA4565A61471C6ABEAE31708E112EC32.ColsAnobron7
	Ft.com	*Review of "Empires of Food" by Evan Fraser and Andrew Rimas* 24 September 2010 http://www.ft.com/cms/s/2/69a3303c-c76a-11df-aeb1-00144feab49a.html
	Using NERC Science newsletter	*Changing role of local government in managing water resources* Relu local government policy and practice note September 2010
October	Relu Newsletter	
	Veterinary Record	*VDC gets off the ground* 2 October 2010 article referencing the Lowe report on farm vet services
	BBC Radio 4	Andrew Lovett interviewed about water quality on *Farming Today* 12 October 2010 http://www.bbc.co.uk/programmes/b00v6lxb#synopsis
	RuSource	*Angling in the Rural Environment* Relu P&P note no 21, 14 October 2010
	SDRN news bulletin	RELU Policy and Practice Note – '*How can flood modelling move upstream*?' and RELU Briefing Paper – '*Informing the Reform and Implementation of the Common Agricultural Policy*'**http://www.sd-research.org.uk/post.php?p=1223 18 October 2010**
	RuSource	*Local government and water* Relu local government P&P note 20, 21 October 2010
	Technobahn news website	*Big Society could play a role in reformed CAP – Relu briefing paper* http://news.technobahn.com/Big_Society_Could_Play_a_Role_in_Reformed_CAP_Say_Researchers_2010102500008340.html *25 October 2010*
	RTPI electronic news bulletin	*Managing Environmental Change at the Rural-Urban Fringe* new interdisciplinary project under the RELU IV programme 29 October 2010 http://www.rtpi.org.uk/item/3875&ap=1
November	Geography Review	*Ecosystem services and land use: a synoptic approach* by Anne Liddon vol 24 no 2 36-39 November 2010 http://www.philipallan.co.uk/geographyreview/index.htm
	RuSource	*Wildlife and farming* Relu Policy and Practice Note no 23 4 November 2010
	Vet Marketing	*Working for small businesses* interview with Philip Lowe about veterinary services Winter 2010 issue 1

	Yorkshire Post	*New voice for upland communities* – Uplands project new website reported 9 November 2010 http://www.yorkshirepost.co.uk/features/New-voice-for-the-communities.6619724.jp
	BBC TV News	*Working with nature to stop floods in North Yorkshire* http://www.bbc.co.uk/news/uk-11763530 16 November 2010 coverage of pilot scheme following Whatmore project
	Farm Business	*Written charter for land use could underpin integrated land management* http://www.farmbusiness.cc/news.asp?section=248&newsid=8369 22 November 2010
	The Ecologist	*Written charter for land use vital for big society management of natural resources* http://www.theecologist.org/News/news_round_up/686826/written_charter_for_land_use_vital_for_big_society_management_of_natural_resources.html 23 November 2010
	Schema-root news	*Written charter for land use vital for big society* http://schema-root.org/region/international/issues/natural_resources/ 23 November 2010
	Britain in 2011	*Save our spaces* p 14 article on sudden oak death project *Disease politics* p 16 article from livestock disease project *Price of Protection* p 16 article on flood management project *Look to the hills* p 19 article on sustainable uplands project
	Institute of Ecology and Env Mgmt magazine (In Practice) special issue on agri-environment schemes	*Feature article from Sutherland project*
	Yorkshire Post	*A rod for their own backs* 26 November 2010 article on Liz Oughton angling project http://www.yorkshirepost.co.uk/country-view/A-rod-for-their-own.6641283.jp
December	Flyforums.co.uk	Discussion of Yorks Post article 3 December 2010 http://www.flyforums.co.uk/general-fly-fishing-discussion/108454-yorkshire-post-article.html
	SDRN bulletin	http://www.sd-research.org.uk/post.php?p=1240#NewPublications 4 December 2010 Angling in the Rural Environment and Big Society P&P notes
	Food Ethics Magazine	*UK Land Use – a waste of space?* By Philip Lowe and Anne Liddon Winter 2010, vol 5 issue 4 p 17
	Anglersnet	*Could commercialisation of angling threaten native species and anglers skills?* 10 December 2010 angling project http://www.anglersnet.co.uk/News/angling-in-the-rural-environment.html
	Angling Times	*Commercial day ticket fisheries are bad for angling* http://www.gofishing.co.uk/Angling-Times/Section/News--Catches/Fisheries-News/December-2010/Commercial-fisheries-bad/ 10 December 2010 Angling project

	Political Studies Association	*Making a policy impact* article highlighting Wyn Grant project feature in AcSS booklet of case studies December 2010 vol 21 no 4

PRESENTATIONS TO STAKEHOLDERS FROM LIVE PROJECTS 2010

Audsley, E., Bateman, I.J., Hutchins, M., Pearn, K., Posen, P. and Rigby, D. (2010) "*The costs of cleaner water: Farming, nitrates and policy*". Presented at *Envecon 2010: Applied Environmental Economics Conference*, 12th March 2010, The Royal Society, London. A mixed audience of academics and policy makers.

Austin Z. (2010) " *Organisational responses: Influencing behaviour and communicating risk*" Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Austin, Z. (2010) "*Devising frameworks and identifying uncertainties in animal disease management"*" Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Banks, C.J. (2010) "*Workshop and discussions on AD and biofuels research*".Chinese Ministry of Agriculture, Tsinghua University, National Agricultural University, North West Agricultural University. Jiangzhou, University. Held in Beijing, China, March

Banks, C.J. (2010) Invited speaker to an awareness raising meeting on the application of anaerobic digestion by the EPSRC Supergen Consortium

Banks, C.J. (2010) Presentation on anaerobic digestion on behalf of selected UK Universities (Imperial College, Birmingham, Cranfield, Glamorgan, Southampton) at the ADBA conference and exhibition, NEC, June

Banks, C.J.,Walker, M., Zhang, Y., and Heaven, S. (2010) "*Stability issues associated with anaerobic digestion of high nitrogen content biomass*". Presentation to the management and scientific staff of BiogenGreenfinch

Barnett, J. (2010) "*Organisational Responses: Influencing Behaviour and Communicating Risk*". Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Bateman, I.J. et al (2010) "*Catchment Hydrology, Resources, Economics and Management (ChREAM)*", University of East Anglia, Norwich, 26 January. HRH Prince Charles and other visiting dignitaries.

Bell, K. (2010) Presentation about the LCP to visitors from the Shropshire Hills AONB Partnership, 10 March, Department of Sociology, Lancaster University (day-long event), Members of Shropshire Council working for the Shropshire Hills AONB Partnership, members of the Land, Life and Livelihoods, Shropshire

Benson, D. (2010) "*Catchment Management in the EU: exploring the scope for learning lessons*". Catchment Management for Protection of Water Resources. Final Project Communications Workshop for Wider National and UK Stakeholders SOAS. University of London November 29th 2010

Benson, D., and Jordan, A. (2010) "*Participation in catchment management in the EU: exploring the scope for lesson drawing from abroad*". Public participation and river basin management in WFD water planning, Luneburg University, Germany, 2-4th September 2010. EU researchers, professionals and stakeholders

Bullock. J. (2010) "*Improving the success of agri-environment schemes*". At 'Delivering ecosystem services through agricultural payments'. 8 February. A RELU and SAGES lunchtime seminar for Scottish Government policy advisors.

Bullock. J.M. (2010) "*The FarmCAT* " July, London. Defra staff.

Cassidy, A. (2010) "*Badgers and bovine TB: coverage of a messy science/policy case in the UK press*". "*Bovine TB: People, Politics and Culture/Hosts, Pathogens and Environments*" workshop, Warwick HRI, University of Warwick, 12th-13th May

Cassidy, A. (2010) "*Vermin, victims and disease: representations of badgers in the bovine TB debate*" Presented at DEFRA Economics and Social Science Advisory Board meeting, 26th January 2010

Cave, J. and J. McEldowney (2010) "*Governance of Livestock Disease*" Cost and responsibility sharing workshop University of Warwick, 22nd October.

Cook, H.F., Benson, D., Smith, L.E.D., Jordan, A., Porter, K. and Porter, M.J. (2010) "*River basin management: a comparison of experience in the UK and the USA*" at 'The Conservation and Management of Rivers, 20 Years On', An international conference at the University of York, UK 6-9 September. UK researchers, professionals and stakeholders

Coombes, E., Fezzi, C., Hutchins, M. and Bateman, I. (2010) "*Identifying cost-effective Water Framework Directive nitrate reduction measures*", *CIWEM annual conference,* London, 28-29 April 2010. An audience of policymakers, academics, environmental consultants, members of the business community, etc.

Cross, P. Rigby, D. & Edwards-Jones, G. (2010) "*Devising frameworks and identifying uncertainties in animal disease management*". Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Davies, A. (2010) "*Community and conservation in UK peatlands: using environmental archaeology to set current debates into a long-term context in Sutherland and the Peak District*". Association for Environmental Archaeology spring conference on the Environmental Archaeology of the North, University of Aberdeen

Davies, A. (2010) "*Life beyond pollen diagrams: communicating long-term ecology*". Scottish Alliance for Geoscience, Environment & Society (SAGES) meeting on Palaeo-ecological, climatological and archaeological reconstruction of the Scottish Highlands for the last ~8000 years, Stirling

Erdem, S. and Rigby, D. (2010) "*What do I fear, what can I control?*" Risk Workshop 3rd-4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Grant, W. (2010) "*Agricultural policy, food policy and communicable diseases policy*". Conference at the University of Michigan EU Center of Excellence

Grant, W. (2010) "*Farmers' perspectives on cost and responsibility sharing*". Cost and responsibility sharing workshop University of Warwick, 22nd October.

Grant, W. (2010) "*Framing the bovine TB issue: the lessons of histor*y". "*Bovine TB: People, Politics and Culture/Hosts, Pathogens and Environments*" workshop, Warwick HRI, University of Warwick, 12th-13th May

Grant, W. (2010) FERA - discussion of issues of stakeholder sharing in relation to cost and responsibility sharing and formed the basis for the workshop

Hampson, D., et al. (2010) "*Predicting microbial pollution concentrations in UK rivers in response to land use change*", University of East Anglia, Norwich, 5 March 2010. Members of the UEA Water Security Research Centre, Norwich.

Hiscock, K. (2010) RELU – Land manager WFD support tool, a presentation to East of England ECSFDI Stakeholder Group Meeting, Natural England, Bury St. Edmunds, Suffolk, 9 July. ECSFDI Stakeholder Group

Inman, A. and Kruger, T. (2010) "*Piloting adaptive catchment management in the Thurne & Tamar*". Catchment Management for Protection of Water Resources. Final Project Communications Workshop for Wider National and UK Stakeholders SOAS. University of London November 29th 2010

Jones, C. and Rigby, D. (2010) "*Reducing E. coli O157 Risk in Rural Communities*". Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Krueger T., Inman A., Hiscock, K., Smith L.E.D. (2010) "*Collaborative modelling for catchment management*", Wensum Demonstration Test Catchment Project Opening Conference: 'Current Initiatives in the Wensum Catchment', 15th July, UEA, Norwich. Regional stakeholders in East Anglia

Krueger T., Inman A., Hiscock, K., Smith L.E.D. (2010) "*Modelling with stakeholders as part of an analytic-deliberative approach to catchment management*". RELU/MOTIVE workshop 'The benefits of social interaction around model', June 30th: ESRC Genomics Policy and Research Forum, Edinburgh, UK. UK researchers and professionals

Krueger T., Inman A., Hiscock, K., Smith L.E.D. (2010). "*Modelling with stakeholders as part of an analytic-deliberative approach to catchment management*". Defra workshop 'Developing a Modelling Mindset with the Demonstration Test Catchment', May 20th-21st: Defra Innovation Centre, Reading, UK. Defra and demonstration test catchment partners

Krueger, T. (2010) 12th May a briefing on project progress, achievements in modelling and plans for continuing work by Tobias Krueger funded by a post project NERC fellowship. Briefing provided at UEA to staff from the River Wandle Trust, Association of Rivers Trusts and Broads Authority. River Wandle Trust, Association of Rivers Trusts and Broads Authority

Krueger, T., A. Inman, K. M. Hiscock and L.E.D. Smith (2010) "*Modelling with stakeholders as part of an analytic-deliberative approach to catchment management*". Paper Number EGU2010-13442. European Geosciences Union General Assembly, May 2nd-7th, Vienna, Austria. International environmental scientists and professionals. EGU is leading European environmental science gathering

Krueger, T., Inman, A., Hiscock, K. and Smith, L.E.D. (2010) "*Model limitations and prediction uncertainty in the context of analytic-deliberative catchment management: acceptance by stakeholders and their role in improving model predictions*". 'HydroPredict' 2010: 2nd International Interdisciplinary Conference on Predictions for Hydrology, Ecology, and Water Resources Management: Changes and Hazards caused by Direct Human Interventions and Climate Change, Prague, Czech Republic, 20-23 September 2010. International.

Lobley, M. (2010) "*Habitat is just another crop*. " RICS ROOTS 2010. April, London. Chartered Surveyors

Lobley. M. (2010) "*Training and advice for agri-environmental management*". July, London. Defra staff

Lowe, P, Phillipson, J. and Proctor, A. (2010) Presentation on "*Rural Policy and Expertise*", Countryside & Community Research Institute Autumn Conference, Cheltenham, 19-10-11. Academics, rural policy-makers

Lowe, P. (2010) "*Stakeholder engagement and research planning: lessons from a major interdisciplinary research programme*" Scientific Advisory Board, Finnish Agri-Food Institute, Kirkkonummi Finland

Lowe, P. (2010) "*The Relu model of knowledge exchange*". At Adapting Rural Living and Land Use to Environmental Change: Launch event of Relu 4th Wave Projects, Manchester

Lowe, P. (2010) "*The Relu programme and animal and plant disease management*"**.** Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Lowe, P. (2010) "*Vets in Transition: Changing professional identities in the UK and US* " Cornell University Veterinary School, Ithaca, USA. Academics and veterinarians

Lowe, P. (2010) "*Vets in Transition: Changing professional identities in the UK and US"* University of Wisconsin, Madison. Academics and veterinarians

Lowe, P. (2010) "*Vets in Transition: changing professional identities in the UK and US*", Government Veterinary Service Conference, 'Veterinary Education: A Global Perspective' Warwick. Veterinary practitioners

Lowe, P. (2010) Key note speech on "*Lowe Report – One Year On*", at the British Cattle Veterinary Association Annual conference, Torquay, 14/15-10-10. Veterinary practitioners, academics

Lowe, P. (2010) Presentation on "*Why Social Scientists should engage with Natural Scientists: the Land Use Challenge*", LYNET Conference, Espoo, Finland

Lowe, P. (2010) Presentation on '*Relu: a Rural Land Use Interdisciplinary Programme*'. Relu/ EPSRC Sustainable Urban Environment workshop, "*Strategic Land Use: Crossing the Urban Rural Divide*", London. Academics and rural land use stakeholders

Lowe, P. (2010) Presentation on the "*Lowe Report*" to the North of England Veterinary Association 17-11-10. Veterinarians

Lowe, P. and Phillipson, J. (2010) "*The Relu Programme: fostering interdisciplinarity and knowledge exchange*" Presentation to Programme Board of Global Food Security programme

Maberly, S. (2010) LCP presentation "*Linking soil phosphorus measurements to phosphorus in watercourses*", 21st February, Loweswater Parish Hall. Community and organisational representatives of EA, NE and LDNPA

Maberly, S., Norton, L., Tsouvalis, J., Waterton, C., Watson, N., Winfield, I., Bell, K. and Webb, L. (2010) LCP presentation "*The LCP – looking back, looking forward*", 15 December. Community and organisational representatives of EA, NT, Relu.

Marcu, A., Uzzell, D., and Barnett, J. (2010) "*Denial of risk in a restorative environment: The case of Lyme disease*". Trees and Forests in British Society, 12-15 April, Edinburgh. Land managers and researchers

Marcu, A., Uzzell, D., Barnett, J., and O'Connell, S. (2010*)* "*Lyme disease patients' information needs and their preferences for precautionary measures*". Poster

presented at the Health Protection Agency conference, 14-15 September 2010, Warwick University. British and European scientists and practitioners

Medley, G. (2010) "*Governance of Livestock Disease*". Relu Animal and Plant Disease Forum. October 5

Mills, P. (2010) "*What cost and responsibility sharing means for plant disease*". Cost and responsibility sharing workshop University of Warwick, 22nd October.

Norton, L. (2010) LCP presentation "*What does farmland provide as well as agricultural produce*", 21st January, Loweswater Parish Hall. Community and organisational representatives of EA, NE and LDNPA

Norton, L., Maberly, S., May, L. and Elliott, A. (2010) LCP presentation "*Linking land Use and Water Quality – Modelling Results and Discussion*", 28th September, Loweswater Parish Hall. Community and organisational representatives of EA, NE and LDNPA

Oliver, D. Latham,S. Wastling, J. and Haygarth, P. (2010) "*A case study in uncertainty from the LIT team: Cryptosporidium*". Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Phillipson, J. (2010) "*Knowledge exchange in Relu*" Relu/ EPSRC Sustainable Urban Environment workshop, 'Strategic Land Use: Crossing the Urban Rural Divide', London. Academics and rural land use stakeholders

Phillipson, J. (2010) "*Telling stories: knowledge exchange across science, policy and practice*". Academics, rural policy-makers and practitioners. IUCN UK Peatland Programme Conference, Durham University

Phillipson, J. (2010) "*The contribution of placement fellowships to knowledge exchange: a Relu perspective*" LWEC Workshop on 'Using Placements in Knowledge Exchange', Defra, London.

Porter, K. (2010) "*Lessons learned in New York catchments*". Catchment Management for Protection of Water Resources. Final Project Communications Workshop for Wider National and UK Stakeholders SOAS. University of London November 29th 2010

Potter et al. (2010) *"Dutch Elm Disease and Sudden Oak Death – a comparative assessment"*: Presentation at Annual Conference of Royal Forestry Society, November. Professional foresters

Potter, C. (2010) "*Lessons from Dutch Elm Disease in Assessing the Threat from Sudden Oak Death*". Relu Animal and Plant Disease Forum. February 11

Quine, C. (2010) "*Assessing and Communicating Animal Disease Risks for Countryside Users*". Relu Animal and Plant Disease Forum. February 11

Quine, C. (2010) "*Assessing and communicating animal disease risks for countryside user*". Forestry Research. RELU Zoonatic. 4th November 2010

Quine, C.P. *et al.* (2010) "*Assessing and Communicating Animal Disease Risks for Countryside Users*". Overview of project and emerging findings, particularly risk mapping, as part of 3rd Project interdisciplinary day, whole project team - Exmoor - 30th March. Invited local stakeholders

Quine, C.P. *et al.* (2010) "*Assessing and Communicating Animal Disease Risks for Countryside Users*". Overview of project findings, including update on project outcomes and the integrated framework for managing and communicating risk to 3rd Meeting of project practitioner panel (PrP), project team - Birmingham – 7th October 2010. Representatives of Land-based organisations

Quine, C.P. *et al.* (2010) "*Assessing and Communicating Animal Disease Risks for Countryside Users*". Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Quine, C.P. *et al.* (2010) "*Assessing and communicating animal disease risks for countryside users*" to a research update organised by Forest Research in association with Institute of Chartered Foresters and CONFOR, Aviemore - 12th Nov. Land and forest managers from state, private and NGO bodies

Quine, C.P., Uzzell, D. & Barnett, J (2010) "*Assessing and Communicating Animal Disease Risks for Countryside Users*" London, 3rd March. Defra Food & Farming Group

Randolph, S, (2010) "*Integrating Evidence on (potential) Intervention for Policy*". Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Reed, M. (2010) "*Interdisciplinary research practices*". Relu/ EPSRC Sustainable Urban Environment workshop, "Strategic Land Use: Crossing the Urban Rural Divide", London.

Reed, M. (2010) "*Sustainable Uplands: re-shaping land use policy for our hills"*. At 'Delivering ecosystem services through agricultural payments'. 8 February. A RELU and SAGES lunchtime seminar for Scottish Government policy advisors.

Scott., A. (2010) "*Managing The Economics of Global Environmental Change at the Rural Urban Fringe*", Paper given to the 5th Annual Green Economics Conference The Age of Global Transformation The Age of Green Economics 29, 30, 31 July 2010

Smith, L. (2010) "*Project's scope and a template for catchment management*. Catchment Management for Protection of Water Resources. Final Project Communications Workshop for Wider National and UK Stakeholders SOAS. University of London November 29th 2010

Smith, L.E.D. *et al.* (2010) 14th June 2010, informal briefing to staff of the Challenge Program for Water and Food, CGIAR, in London. CGIAR

Smith, L.E.D. (2010) "*Catchment Management for Protection of Water Resources: Lessons from a Research Project Funded by RELU*", presentation to a meeting of the Somerset Water Partnership, Langport, Somerset. 14th October 2010. Somerset Water Partnership

Smith, L.E.D. *et al.* (2010) "*Catchment Management Strategies for Control of Land Use Based Water Pollution*", 2010 World Water Week in Stockholm, Responding to Global Changes: The Water Quality Challenge – Prevention, Wise Use and Abatement, 5-11 September 2010, Stockholm, Sweden. International researchers and professionals. Leading global annual water event

Smith, L.E.D., Cook, H., Inman, A., Benson, D., Jordan, A. (1010) "*Sinking or swimming? surveying community based catchment groups in England and Wales*". Presented at 'Water and Environment 2010', CIWEM's Annual Conference, Olympia Conference Centre, London, 28-29th April. UK and international environment and water professionals and researchers. CIWEM is leading relevant professional body

Strachan, N (2010) "*Reducing E.Coli 0157 Risk in Rural Communities*". Relu Animal and Plant Disease Forum. October 5

Strachan, N, Jones, C, Forbes, K, and Farrington, J. (2010), "*Reducing E.Coli 0157 Risk in Rural Communities*", Aberdeen. FSAS

Strachan, N. Farrington, J. and Jones, C. (2010) "*Reducing Escherichia Coli O157 Risk in*

Rural Communities: Integrating Evidence For Policy" Risk Workshop 3rd- 4th November, 2010 The Royal York Hotel. Researchers, government departments, industry representatives

Swinbank, A. (2010) "*Bioenergy*", Agra Informa's 'A Practical Seminar on the Common Agricultural Policy', London, 3 December

Tsouvalis, J. (2010) "*Loweswater Care Project (LCP) Experience*". Catchment Management for Protection of Water Resources. Final Project Communications Workshop for Wider National and UK Stakeholders SOAS. University of London November 29th 2010

Tsouvalis, J. and Bell, K. (2010) Northern Rural Network invited presentation at the event 'Future of the Uplands', 2 March, Mickleton Village Hall, Co. Durham. Mixed audience including government representatives (NE, LDPA, EA, etc.), Commission for Rural Communities representatives, farmers' groups representatives, farmers, academics

Tsouvalis, J. and Norton, L. (2010) Presentation 'The Loweswater Care Project (LCP) Experience' 29 November, SOAS, London. Mixed stakeholder and academic audience

Wastling, J. (2010) "*Assessment of Knowledge Sources in Animal Disease Control*". Relu Animal and Plant Disease Forum. October 5

Waterton, C. (2010) "*What does adaptation mean?*" At *Adapting* Rural Living and Land Use to Environmental Change: Launch event of Relu 4th Wave Projects, Manchester

Waterton, C. and Tsouvalis, J. (2010) LCP Presentation "*Translating Understandings into Actions*" 18th March, Loweswater Parish Hall. Community and organisational representatives of EA, NE and LDNPA

Whatmore, *et al.* (2010) "*Understanding Environmental Knowledge Controversies*". Annual Defra Flood and Coastal Defence Science Meeting.. Defra and other flood defence practitioners

Whatmore, *et al.* (2010) Technical report on the Uckfield model, Overflow. Uckfield stakeholders

Williams, P. (2010) "*E. coli* O157 *and immunity amongst farmers*". NFU and FUW meetings at six branch meetings in north Wales. Farmers, Farmer' Union representatives and branch chairs

Williams, P. (2010) "*E. coli* O157: *the blame game*". Guild of Graduates meeting, Bangor University (Bangor, 18/05/10). Academics, students, lay people

Woods, A. (2010) "*Delivering Disease Prevention: Insights from History*". Defra Seminar. London 17/11/2010

Annex C: CONFERENCES/WORKSHOPS ATTENDED BY DIRECTOR'S OFFICE

Feb 10	Workshop for ESRC Investment Directors on the topic of *'Good Practice for Increasing Impact'*, Aston University, Birmingham.
	Defra Workshop on "*UK Low Carbon Farming to 2050"*, Innovation Centre, Reading
	Foresight Project Land Use Futures: Launch of Project Findings, Royal Society London
	Delivering ecosystem services through agricultural payments Relu/SAGES seminar for Scottish policy advisers, Pentland House, Edinburgh
Mar 10	Northern Rural Network Seminar, Mickleton, Co. Durham *Future of the Uplands* included promotion of "*Drivers for Environmental Change"*, authored by Relu researchers
	Defra workshop, London "Rural Transformations and Rural Policies in the UK and US"
	"Understanding rural communities using social science data", Defra Innovation Centre, Reading. Commission for Rural Communities (CRC), the Rural Economy and Land Use programme (Relu) and the UK Data Archive (UKDA) seminar
	Northern Rural Network *CAP Reform Short Course*, Newcastle, sponsored by Relu.
Apr 10	**Invited address:** Presentation on *"Why Social Scientists Should Engage with Natural Scientists: Lessons from a Major Interdisciplinary Research Programme in the UK"* Luigi Einaudi Lecture, Institute for European Studies, Cornell University, Ithaca, USA
	Invited address: Presentation on *"Why Social Scientists Should Engage with Natural Scientists: Lessons from a Major Interdisciplinary Research Programme in the UK"* Penn State University, US
	Invited address: Presentation on *"The Creativity Claims of the Engaged Social Sciences: The Case of Rural Sociology in the US and Europe"* Development Sociology, Polson Institute, Cornell Center for Sustainable Future, Ithaca, USA
	Invited address: Presentation on *"Vets in Transition: Changing professional identities in the UK and US"* Cornell University Veterinary School, Ithaca, USA
	Invited address: Presentation on *"Vets in Transition: Changing professional identities in the UK and US"* University of Wisconsin, Madison
May 10	Food and Environment Research Agency Workshop on *"Responsibility and Cost Sharing"* FERA, York
	Relu workshop *Bovine Tuberculosis: Hosts, Pathogens and Environments,* Warwick HRI.
	Relu workshop *Regulating plant diseases; the role of stakeholders in governance?* London
Jun 10	**Lesson learning:** LWEC Workshop on *"Using Placements in Knowledge Exchange"*, Defra, London. Presentation on *"The contribution of placement fellowships to knowledge exchange: a Relu perspective"*
	Invited address: Presentation on *"Copying or subverting American models: the foundation of European Rural Sociology",* Wageningen, Netherlands.
Jul 10	*Adapting Rural Living and Land Use to Environmental Change: Launch event of Relu 4th Wave Projects,* Manchester
Sept 10	Contribution of the Livestock Sector on the Environment and Society, BIS Conference Centre, London
	Invited address: Government Veterinary Service Conference, "Veterinary Education: A Global Perspective" Presentation on *"Vets in Transition: changing professional identities in the UK and US*", Warwick
	Invited address: IUCN UK Peatland Programme Conference, Durham University. Presentation on *"Telling stories: knowledge exchange across science, policy and practice"*
	Invited address: Scientific Advisory Board, Finnish Agri-Food Institute, Kirkkonummi Finland. Presentation on *"Stakeholder Engagement and Research Planning: Lessons from a Major Interdisciplinary Research Programme"*
	Relu end of project conference *"Integrated systems for farm diversification into energy production by anaerobic digestion"* University of Reading
Oct 10	**Invited address:** Presentation on "*The Lowe Report: One Year On*", British Cattle Veterinary Association Annual Conference, Torquay
	Invited address: Presentation on *"Rural policy and expertise"*, Countryside and

	Community Research Institute Annual Conference, Cheltenham
	Project Practitioner Panel for *"Assessing and Communicating Animal Disease Risks for Countryside Users", Birmingham*
	Project workshop *"Policy and disease containment strategies in Cryptosporidium: Living with uncertainty"* UKWIR, London
	Relu/ EPSRC Sustainable Urban Environment workshop, *"Strategic Land Use: Crossing the Urban Rural Divide",* London. Presentations on *"Relu: a Rural Land Use Interdisciplinary Programme"* and *"Knowledge Exchange in Relu"*
	Project workshop *"Sustainable Uplands: how can policy address an uncertain future for UK uplands?", London*
Nov 10	*"An Invitation to Shape the Nature of England"* Natural Environment White Paper Workshop – Defra, Birmingham.
	Lesson learning: Presentation to Programme Board of Global Food Security programme on experience of Relu interdisciplinarity
	Invited address: Presentation on *"Why Social Scientists should engage with Natural Scientists",* Aberdeen Centre for Environmental Sustainability, University of Aberdeen
	Invited address: Presentation on *"Rural Policy and Expertise"*, Macaulay Land Use Research Institute, Aberdeen
	Relu conference on *"Risk and uncertainty in the context of animal and zoonotic disease management"*, York.
	Relu end of project conference "*Catchment management for protection of water resources"*, University of London
Dec 10	**Invited address:** Presentation on *"Why Social Scientists should engage with Natural Scientists: the Land Use Challenge",* LYNET Conference, Espoo, Finland
	Relu end of project conference *"New forms of participatory environmental governance: experiences and challenges from Loweswater, Cumbria"*, Penrith
	Loweswater Care Project Meeting, Penrith
	RVC Seminar *"Economics of animal health and production",* London

Annex D: EXTERNAL ENGAGEMENT AND EXPLOITATION

Level of usage of any research resources generated	High. See section 2 and 4
Level of co-funding by business and government agencies of any research resources generated	Additional funding of £100k for RELU Phase IV on 'Adapting Rural Living and Land Use to Environmental Change' was provided Scottish Government.
Number of interactions/events focused on public participation and engagement	Several thousand interactions with various non-academic publics/audiences
Number of researchers trained in media and public engagement skills (not funded centrally by ESRC)	Unknown
Number of collaborative ESRC research projects	All 94 of Relu research projects involve collaboration with other Research councils and have active stakeholder engagement (see section 4)
Amount of external funding for joint research (excluding joint Research Council projects)	Additional funding of £100k for RELU Phase IV on 'Adapting Rural Living and Land Use to Environmental Change' was provided Scottish Government.
Number of users placed with research programme	11 visiting fellows
Number of researchers placed in user organisations	2 work shadowers