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PROGRAMME DIRECTOR'S ANNUAL REPORT FORM

PROGRAMME DIRECTOR'S ANNUAL REPORT 2011

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 2011 to 31 December 2011**

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

Budget for Programme: **£26,644,434**
(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 (2004-2011): **£4,243,272**

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Executive Summary

All of the remaining Relu projects funded under the third wave on the management of animal and plant diseases were concluded and the fourth wave of projects on 'Adapting Rural Living and Land Use to Environmental Change' in conjunction with the LWEC programme were well underway in 2011. Scientific output continues to build. At programme level a prestigious Theme Issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases' was published and a high profile series of articles on social science aspects of animal disease appeared in the *Veterinary Record*. There were around 200 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 the role of protected landscapes, the management of animal and plant diseases, and the growth of the rural economy.

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 the second, third and fourth 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	10
Third Call Research Projects	11	11	0	6
Fourth Call Projects	9	9	0	0
Interdisciplinary Fellowships	5	5	0	2
Interdisciplinary PhDs	16	16	0	6

Year of the Programme: Year 8 (2011)

Co-funding and collaboration during the year: The programme is a collaboration between the ESRC, BBSRC and the NERC. It has a budget of £26,644,000, 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 third wave of funding on the management of animal and plant diseases concluded their work in 2011. The final wave of projects on 'Adapting Rural Living and Land Use to Environmental Change' in conjunction with the LWEC programme were well underway. Scientific output continues to build and a prestigious Theme Issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases' was published. There were over 200 items recorded during the year in national, local and trade media. A major interactive conference "*Who should run the countryside?*" took place at The Sage Gateshead in November, attracting over 200 delegates from all over the country. Other conferences and workshops were held on "Catchment management for protection of water resources"; "Transforming knowledge for upland change"; "Catchment management and public engagement"; "New forms of participatory environmental governance", "Collaborative conservation in agri-environment schemes", "Conservation conflicts" ; "Stakeholder views on involvement in academic led research"; "Managing environmental change at ther rural-urban fringe"; and "Assessment of knowledge sources in animal disease control".

Delivering Results and Impact

Key strategic findings from projects that came to a close in 2011 relate to projects on animal and plant disease. The Governance of Livestock Disease Project made significant observations about the part that better information for buyers about the health status of herds could play in reducing the prevalence of disease, which attracted publicity from the trade press. Reducing E coli Risk in Rural Communities made significant recommendations about how land managers could reduce the risk to visitors and contributed to the enquiry into the Godstone Farm outbreak. While Assessing the Potential Rural Impact of Plant Disease emphasised the need for precautionary measures to reduce the risks of plant disease. The final disease project to be completed – Assessment of Knowledge Sources in Animal Disease Control – emphasised the strengths of applying interdisicplinarity and called for more clarity about how different organisations prioritise the management of particular diseases.

Other completed research projects included 'Catchment Management of Water Resources' which has drawn on international experiences in water catchment management to develop a catchment management template and information tools, such as a simple report card, for keeping stakeholders informed about water quality. The project continues to feed its work in Defra's Demonstration Test Catchment Initiative. The Science in the Field project reported on its research exploring the key role of specialist advisers as knowledge brokers and has identified significant ways in which these professionals repackage knowledge and also develop new expertise and knowledge in the field. While the role of agri environment schemes has come under the microscope in the Collaborative Conservation in Agri Environment Schemes project which has highlighted the ecological benefits of landscape-scale land management.

During the year the programme has made significant contributions to policy debates, drawing on evidence from across the projects, in such areas as the management of animal and plant diseases and growth of the rural economy. Relu publications have been carefully targeted to key policy audiences. Nine Policy and Practice Notes were

published, including two in the new series specifically targeted at local authority audiences and advised by Relu's local authority advisory group (see 4.1). Evidence submitted by Relu to Government committees includes: Evidence for the *Environmental Audit Committee Inquiry on Sustainable Food* to which Relu Director Philip Lowe was also called to give oral evidence and a report was submitted on *Sustainable Agricultural Intensification – Encapsulating and Motivating Policy Adjustment* by Relu researcher Noel Russell; a Submission to the *EFRA Committee inquiry into Farming Regulation* compiled for Relu by Land Use Consultant Alan Woods; oral evidence by Laurence Smith from *Catchment Management for Protection of Water Resources* project, to the House of Lords Agriculture, Fisheries and Environment EU Sub-Committee inquiry into *EU Freshwater Policy*; and a submission to Defra's *Rural Economy Growth review* led by Relu Assistant Director Jeremy Phillipson.

Four briefing papers were also published. Evidence from Relu's earlier briefing paper on the CAP was cited by the EFRA committee in its report on The Common Agricultural Policy after 2013. Evidence provided in Relu's *Shaping the Nature of England* briefing paper submitted in response to the Environment White Paper was cited in Landscapes of the Future POSTnote published by the Parliamentary Office of Science and Technology. The Programme Director was invited to attend a dinner with the Duke of Edinburgh to discuss the rural economy.

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 NERC and LWEC, UK Environmental Observation Framework, NERC Natural Hazards Programme, Ecosystem Services for Poverty Alleviation (ESPA), British Association of Animal Science, NERC's QUEST Programme. Invited addresses were given at various conferences and institutions, including: the RVC; the University of Edinburgh, the Royal Society conference on *Reducing greenhouse gas emissions from agriculture*; the LYNET Conference, Finland; the Royal College of Veterinary Surgeons working group on Vet Specialisation; the University of Nottingham; Cardiff University, British Academy conference on *Engaging Academic Social Scientists in Government Policy Making and Delivery*; the LWEC meeting on *"Integrated Research and Decision-making for the Land;* the NERC "*Knowledge Exchange Good Practice"* event; the international conference on *"Interdisciplinary progress in environmental science and management"*; the National Centre for Research Methods; the European Commission; House of Lords; and the G8 Heads of Research Assessment.

Adapting Rural Living and Land Use to Environmental Change
Relu's fourth and final major wave of projects got underway in 2011 and form part of the Living with Environmental Change (LWEC) Programme. 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. All the projects have organised events to bring stakeholders right into the heart of the research process. Events have included workshops specifically for particular

groups of stakeholders and special sessions at high profile conferences, such as the ACES conference in Aberdeen and the UK/Ireland Planning Research Conference in Birmingham. Some projects have developed new and innovative ways of working, such as the "Rufopoly" game developed by Managing Environmental change at the Urban Fringe project who have been using this engaging new board game to work with diverse groups – from students to planning authorities – as a means of examining priorities for development in the marginal lands where town meets countryside.

Strategic Influencing – Animal and Plant Disease Management

The year saw the culmination of strategic influencing and building of a community of stakeholder interest in the field of animal and plant disease management. The programme has established a core community of 200 key stakeholders, around which in 2011 we targeted a series of publications and four events including a major interactive workshop: *New Horizons for Animal and Plant Disease from the Relu Programme* in Central London in May 2011 (see 4.2). This event was designed to facilitate maximum interaction between research teams and specifically targeted stakeholders and discussion on current topics of concern. Drawing on this event, the Relu Briefing paper14 "Growing Concerns: Animal and plant disease policy for the 21st century" was then published and made widely available throughout the stakeholder community.

Science highlights:

1. Innovative methods involve residents in flood research

Interdisciplinary research requires innovative methods and researchers from the Relu programme have developed some fascinating new approaches. The *Understanding Environmental Knowledge Controversies* team from Oxford, Durham, Newcastle and UEA won a Relu Award for best example of innovative methodology for their project which brought together scientists and residents in "competency groups" to investigate problems of flooding in Ryedale and Uckfield. Activities centred on bi-monthly meetings in which hands-on computer modelling became the key practice. Each Group was supported by a password-restricted website hosting a resource depository for materials collected by group members and a group blog. Audio and video recordings were made of Group meetings, and transcribed for use by all members. The ethos of this way of working demands a sustained commitment from all to negotiate the different modes of reasoning of fellow participants and to appreciate the different kinds of expertise brought to the collaborative production of knowledge. In turn, this requires the redesign of research ethics protocols to reflect the equal claims of Group members to materials produced together. The Project has produced a web-resource to assist others in trying out Competency Groups for themselves. The work resulted in the nomination of Pickering as a Defra Demonstration Project, led by the Forestry Commission but with Relu researchers involved in this project funded to apply the models further to Pickering. The Group's model has also become the basis of a suite of other interventions (eg woody debris dams and floodplain woodland) because it provides a tool for demonstrating why the question 'can rural land management be used to reduce flood risk?' is contingent upon where in the river catchment an intervention or management practice is located and, hence, how to optimise what to do where. It has also meant that the Environment Agency has been able to re-engage with the community in taking a solution forward, providing a model for an alternative way of doing flood risk science, of much wider relevance.

2. Understanding E coli O157 in the environment

E. coli O157 can cause severe illness in individuals, particularly children. In August and September 2009, an outbreak of *E. coli* O157 disease occurred at Godstone Farm (a farm open to visitors) in Surrey. This is the largest outbreak of *E. coli* O157 linked to an Open Farm to have occurred in the UK, with 93 people affected in total. Most of these (over 80%) were under 10 years of age, and 17 children were diagnosed with a complication of *E. coli* O157 disease, called haemolytic uraemic syndrome (HUS), which can cause permanent kidney damage. Following the outbreak, the UK's Health Protection Agency (HPA) established an independent investigation to understand why it happened and to make recommendations to reduce the risk from *E. coli* O157 to those who visit Open Farms in the future. Research from Relu's Reducing E coli risk in rural communities project undertook to understand, for the first time, how aware farmers, other rural residents, and countryside visitors, are of *E. coli* O157. They carried out surveys in Grampian, Scotland and north Wales to find out, for example, whether people had heard about *E. coli* O157, how people thought they might become infected, and what the symptoms of infection might be. Results were sent to the Chair of the HPA *E. coli* O157 investigation and the project subsequently provided written and oral evidence to the investigation committee. The project found that only around half of those who responded to the questionnaire had heard of *E. coli* O157, with lowest awareness found amongst visitors to the countryside, and highest awareness amongst Grampian farmers. The HPA report contained several references to their work. The researchers were also able to make very specific policy recommendations on targeting of information to parents and carers of young children, on safety precautions at open farms, and on precautions that could be taken to reduce risks posed by E coli O157 in rural settings eg regarding grazing of animals in fields used for camping, persistence of the organism on farm gates etc.

3. Rethinking the role of field advisers and how they are trained

We know that field advisers such as land agents, vets and ecologists play an important role in bringing science to the farm, but Relu's project on Field Advisors as Agents of Knowledge Exchange has found that we might need to rethink our understanding of how this process happens. They discovered that these key professionals are not simply conduits of formal science, but also generate their own knowledge at field level. Farmers look to their advisors to absorb complex, ambivalent messages from diverse sources, including technical, commercial and legislative developments and "translate" them into terms they can understand and act upon, taking into account local and personal circumstances. They may also work with other professions to create new knowledge. Vets in particular said that they would experiment with new approaches. The implications are wide-ranging, particularly in how we prepare these professionals for their roles. Training establishments need to become more adept at helping them to become lifelong learners and practical experimentalists. Systems should address the complexity of multiple professions working together and learning from each other and improve their understanding of networks. Academics involved in training field professionals need to acknowledge the importance of field expertise and practice needs to have greater emphasis on the formal training of field practitioners.

Dissemination highlights:

1. Debates, games, interactivity and song replace powerpoint

Relu's "Who should run the countryside" conference set out to be different from the usual academic conference, avoiding traditional presentations from academics armed with powerpoint slides. Held in the stunning surroundings of The Sage, Gateshead, on the south bank of the Tyne, the event was planned around a series of debates on topical issues facing the countryside featuring high profile and provocative speakers. Topics were: Whether food production or biodiversity should take precedence; whether 21st century land ownership is a responsibility or a privilege; and whether individual actions can help to save the Earth. Two smaller panel-led discussions focused on the pros and cons of environmental modelling, and whether farmer or state should take responsibility for animal disease. Throughout the day delegates also got involved in activities such as scoring their kitchen in the clickin' chicken interactive quiz and learning about the rural-urban fringe by playing "Rufopoly". A dozen Relu projects put on interactive displays about their research and there were even singers and a storyteller from the Sustainable Uplands project who performed to considerable acclaim. The Relu Awards featured prominently, with films about the finalists showing all day, and delegates casting their votes to decide the winners. The highlight of the conference was the presentation of the specially-commissioned Relu awards by Sir Howard Newby. Over 200 delegates from academia, business, policymaking and the public sector and third sector organisations attended the conference. Feedback has been overwhelmingly positive, with comments including: "Innovative, engaging, and a radical move away from boring academics doing boring presentations. It was a model for how engaged research should be presented and celebrated. Excellent!" "The format of the meeting was really unusual but worked extremely well." "The debates were thought provoking and the interactive approach was especially innovative and enjoyable."

2. The Relu Awards – Methodological Innovation and Impact

The Relu Awards formed a key element in Relu's "Who should run the countryside?" conference, and extended Relu's philosophy of stakeholder engagement and citizen science into the judging of scientific innovations and impacts. The awards aimed to combine the populism of "X factor" voting with rewards for high quality research in the spirit of the Oscars. Entries were invited in two categories: Best example of innovative methodology and Best Example of Impact, with all the projects encouraged to enter in both categories. Stakeholders were involved throughout the process of selecting the eventual winners. Entries were then sent out to the judging panel for grading and the two highest scoring finalists in each category selected. All the "Impact" entries were included in Relu's Briefing Paper "Changing landscapes: Some achievements of the Rural Economy and Land Use Programme", while the "Methodology" entries were fed into "Innovation in Interdisciplinary Methods – the Relu Experience" published by the Relu Data Support Service. These new publications were launched at the conference. In the meantime a film company was commissioned to make five minute films about each of the four finalists, to be shown at the conference. Delegates were able to vote during the day to decide the overall winners. These were: *Sustainable Uplands: learning to manage future change*; and *Understanding Environmental Knowledge Controversies*: *The Case of Flood Risk Management.* The Awards – made by a glass artist for the occasion and inspired by the Relu corporate branding – were presented as a finale to the conference by Sir Howard Newby.

3. Capacity Building and the Research Environment

3.1 Scientific Output

35 presentations and papers were given by Relu researchers at conferences and workshops and at least 25 journal articles were published in 2011 by ongoing projects (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 published a Theme Issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary Perspectives on the Management of Infectious Animal and Plant Diseases' (Volume 366, Number 1573)**.** The issue was edited by Philip Lowe, Jeremy Phillipson, Laura Green, Stephen Hunter, Mike Jeger, Guy Poppy and Jeff Waage and dealt 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.

Contents:

Abigail Woods *A historical synopsis of farm animal disease and public policy in twentieth century Britain*

Gareth Enticott, Andrew Donaldson, Philip Lowe, Megan Power, Amy Proctor and Katy Wilkinson *The changing role of veterinary expertise in the food chain*

Clive Potter, Tom Harwood, Jon Knight, and Isobel Tomlinson *Learning from history, predicting the future: the UK Dutch elm disease outbreak in relation to contemporary tree disease threats*

David Carslake, Wyn Grant, Laura E. Green, Jonathan Cave, Justin Greaves, Matt Keeling, John McEldowney, Habtu Weldegebriel, and Graham F. Medley *Endemic cattle diseases: comparative epidemiology and governance*

David Chandler, Alastair S. Bailey, G. Mark Tatchell, Gill Davidson, Justin Greaves, and Wyn P. Grant *The development, regulation and use of biopesticides for integrated pest management*

N. J. C. Strachan, C. J. Hunter, C. D. R. Jones, R. S. Wilson, S. Ethelberg, P. Cross, A. P. Williams, L. MacRitchie, O. Rotariu, and D. Chadwick

The relationship between lay and technical views of Escherichia coli O157 risk

Christopher P. Quine, Julie Barnett, Andrew D. M. Dobson, Afrodita Marcu, Mariella Marzano, Darren Moseley, Liz O'Brien, Sarah E. Randolph, Jennifer L. Taylor, and David Uzzell *Frameworks for risk communication and disease management: the case of Lyme disease and countryside users*

Robert Fish, Zoe Austin, Robert Christley, Philip M. Haygarth, Louise A. Heathwaite, Sophia Latham, William Medd, Maggie Mort, David M. Oliver, Roger Pickup, Jonathan M. Wastling, and Brian Wynne *Uncertainties in the governance of animal disease: an interdisciplinary framework for analysis*

Peter Mills, Katharina Dehnen-Schmutz, Brian Ilbery, Mike Jeger, Glyn Jones, Ruth Little, Alan MacLeod, Steve Parker, Marco Pautasso, Stephane Pietravalle, and Damian Maye *Integrating natural and social science perspectives on plant disease risk, management and policy formulation*

Mark Woolhouse *How to make predictions about future infectious disease risks*

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. Forty disciplines are represented in the Programme, with every project including natural and social scientists.

How Relu has developed this novel approach was outlined during the year in Briefing Paper 16 "Adventures in Science". This briefing paper explains how Relu has broadened and strengthened collaboration between environmental and social sciences, bringing together qualitative as well as quantitative disciplines and methods, and novel disciplinary collaborations e.g. hydrology and sociology; ecology and political science. Many projects integrated the contributions of different disciplines as well as of stakeholders, through joint scrutiny of concepts, approaches and evidence. Teams focused on interdisciplinarity from the planning stages of projects, by jointly framing research problems and strategies, through shared development of methodologies or collaborative data-gathering. Some projects have used geographic information systems, scenarios and visualisation methods to integrate social and natural science data, as well as stakeholder expertise; some have used linear or complex modelling approaches, combining environmental, biological and social and economic data; while others have developed appraisal frameworks and decision tools to combine and evaluate their results. Relu has forged new strategic links between the social and biological sciences, for example in the area of the management of animal and plant disease. The stand-off between social and biological sciences in the past seriously limited their ability to respond to cross-cutting issues of critical importance, such as in the field of plant/animal and human interactions, and distorted the evidence base on which policy could draw, to the detriment of both communities. In many fields of modern biology our science is world-leading, but that is often not followed through into successful applications because the research is not joined up with economic factors or put into a social context. The Relu approach has helped to overcome these barriers.

Relu researchers also continue to take the programme's interdisciplinary insights and outlook into strategic positions in research and practice:

- **Tim Benton** who was co-investigator on Effects of Scale in Organic Agriculture has been made Global Food Security Champion for UK.
- Relu researchers **Dave Raffaelli** and **Piran White**, are now leading the major NERC thematic programme on Biodiversity and Ecosystem Service Sustainability (BESS).

- Relu Director **Philip Lowe** has been appointed as an Independent Member of the Scottish Government's Strategic Research Programme Board for Rural and Environment Research.
- **Alister Scott** who is leading Relu's *Managing Environmental Change at the Rural-Urban Fringe* project has been appointed to the Chair of Spatial Planning and Governance in the School of Property, Construction and Planning at Birmingham City University.
- Relu Interdisciplinary Fellow **Evan Fraser** has been awarded a Research Chair in Food Security at the University of Guelph in Canada.
- Relu Assistant Director **Jeremy Phillipson** and researcher **Michael Winter** have been appointed to Defra's high level advisory panel in relation to its Rural Economy Growth Review.
- **Clive Potter** who led Relu's *Lessons from Dutch Elm Disease in Assessing the Threat from Sudden Oak Death* was asked to join a Tree Health Expert Group set up by Defra to look into, and make the case for, more research and policy action on this issue.

The Director's Office has given several presentations during the year reflecting on Relu's interdisciplinary approach. This included:

- Invited addresses on Relu and Interdisciplinarity at an interdisciplinary masterclass: Leadership for Interdisciplinary Environmental Initiatives, University of Edinburgh
- Invited address for Cardiff University lecture series on "Why Social Sciences should engage with natural sciences"
- Invited address on "Engaging academic social scientists in government policy making and delivery" at British Academy "Promoting Links between researchers and Government".
- Invited address at international conference "Interdisciplinary progress in environmental science and management".

3.3 Programme Wide Events and Networking

Programme-wide events organised by the Director's Office included the major animal and plant disease event *New Horizons for Animal and Plant Disease from the Relu Programme* (May), two joint events with the Northern Rural Network: *Catchment Management and Public Engagement* (Feb) and *Uplands Policy Review and the Role of National Parks* (Sept) and *Who Should Run the Countryside?* a major celebration of the Relu Programme at Gateshead in November (see 4.2).

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 6 completed prior to reporting period and 1 completed during 2011 (Alison Hodge). Relu PhD students are successfully securing new positions following their research.

There are also 5 Relu Interdisciplinary Early Career Fellows. Two interdisciplinary fellows completed her research prior to the reporting period (Fraser and Davis) and the

other three fellows (Woods, Cassidy and Appleton) completed their projects during the year (see 5.5). Evan Fraser has now been awarded a Research Chair in food Security at the University of Guelph in Canada. Angela Cassidy has been appointed Research Associate on the major *One Medicine? Investigating Human Disease 1850-2015* project at Imperial College, led by Abigail Woods.

Relu Director Philip Lowe gave the opening address at a two-day Masterclass for managers and managers-to-be of interdisciplinary research programmes. The event was organised by Catherine Lyall, Laura Meagher and Ann Bruce, of the University of Edinburgh. The focus of the event was on the challenges of interdisciplinary leadership at the project, programme and institutional levels. It was attended by about 40 research leaders, including major research programmes in the UK.

3.5 Data Collection and Management

During 2011, the Relu Data Support Service (Relu-DSS) redeveloped its website into a Relu Knowledge Portal, analysed the interdisciplinary methods and approaches used by Relu projects and continued with the archiving of Relu data collections.

The new Relu Knowledge Portal (http://relu.data-archive.ac.uk) provides access to research data, publications, outputs and interdisciplinary methodologies from Relu projects, and showcases Relu's data managing and sharing expertise. The website was made more user friendly, and shifted from primarily providing functional data management and archiving guidance for Relu researchers, towards a resource that demonstrates the legacy of the programme. The website moved to an Umbraco content management structure, in line with the UK Data Archive website. Its look, style and content were redesigned; and faceted searching was developed across the portal's resources: projects, data collections, publications and methodologies. The new portal was presented at the Relu celebration conference in November 2011. The portal contains information about and provides access to Relu's 163 archived datasets, 1042 research outputs and 70 project records. Monitoring internet traffic to the Relu-DSS website (Jan 2011 – March 2012) with Google Analytics shows that the website is used frequently: 21,000 page visits from 6500 visitors (84% new and 16% returning visitors) who spend on average 2 minutes on the site. Sixty percent of visits result from search traffic and thirty percent from referral traffic, mainly referred from the Relu, UK Data Archive and ESDS websites.

The harvesting of research outputs and publications from the ESRC Research Catalogue (previously ESRC Society Today repository) required significant effort to restore in the first half of 2011. Due to the redevelopment and restructuring of the ESRC website, ESRC's metadata publishing ceased and was restored in a changed format after several months, which needed redevelopment of the Relu-DSS harvesting to restore functionality.

Relu data continue to be archived across the UK Data Archive (UKDA) and the Environmental Information Data Centre (EIDC) of the Centre for Ecology and Hydrology (CEH). Outputs are harvested weekly from the ESRC Research Catalogue through an Open Archives Initiative Metadata Harvesting Protocol (OAI-MHP). All data collections that had been received with full documentation and licence by 31 May 2011 (when the

DSS data processor contract ended) were processed and archived. Data collections received since are being processed for archiving by the UK Data Archive's data processing team. Data for 23 projects have been archived so far; socio-economic data for all are held at UK Data Archive and ecological data for nine projects are held at EIDC. A further 5 collections are currently in processing and 4 are awaiting deposit.

Relu researchers have developed innovative interdisciplinary and data integration methodologies that were featured in the Relu Awards in November and has been shared via the briefing paper "Innovation in interdisciplinary methods: the Relu experience" published by the Data Support Service. This demonstrates the variety of interdisciplinary methods and approaches that projects have used for collaboration between social and natural scientists and for integrating cross-disciplinary methodologies, research perspectives and data. The approaches chosen and developed show great creativity and diversity, with many projects applying a combination of methods.

The Relu Data Support service contract ended on 31 May 2012, with a non-funding extension until 30 November 2011.

3.6 Programme Management

Relu's final meeting of its Strategic Advisory Committee met in November. Discussion took place on the Relu Communication Plan for 2012-2013, the evaluation of the programme, and the programme's legacy.

3.7 Added Value

Promoting synergy between research projects
As well as programme-wide events and publications (see Sections 3.1, 4.1, 4.2, 4.3) there was active encouragement of other 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. The programme has supported and sponsored numerous joint events:

- *'Catchment management and public engagement'* in partnership with the Northern Rural Network. The event, held at Newcastle University and attended by 50 people, presented case studies from 4 Relu projects and engaged stakeholders in discussions on how local solutions to the management of flood risk can be designed and facilitated, by bringing together academic research and local expertise.
- An event on *The Uplands* in Newcastle in September in partnership with Northern Rural Network to explore the implications of the 2011 Defra Uplands Policy Statement and subsequent developments, and to examine the specific significance for National Parks. Sixty people attended and keynote addresses were given from two Relu projects.
- *'Managing environmental change at the rural-urban fringe';* organised a special Relu sponsored session at the UK Planning Research Conference in Birmingham in September with a planning perspective. This featured presentations from 5 Relu projects.
- *'Going with the flow: participatory approaches to river catchment management'* at Durham University, a Relu sponsored event with researchers and project stakeholders, involving two relu projects.

- An interdisciplinary conference was organised on *Conservation Conflicts for a Changing World* by Aberdeen Centre for Environmental Sustainability in collaboration with Relu's Sustainable Uplands project in August 2011, involving researchers from several Relu projects. It included scientific exploration, discussion, and discovery with a range of social and natural scientists, policy makers and artists from all over the world.

Making international connections

Relu's interdisciplinary approach has been promoted internationally. For example:

- Relu's *Catchment Management for the Protection of Water Resources* project team has been engaged in a scoping study for 'Mitigation of Non-Point Source Pollution in China'. Working with partners from the Agro-Environmental Protection Institution, Ministry of Agriculture, Beijing and other leading Chinese Universities, the team is exploring how the principles and approaches investigated in their Relu research may apply in China. The scoping study, funded by Defra's International Sustainable Development Fund and the Ministry of Agriculture in China, is a part of the China-UK Sustainable Agriculture Innovation Network (SAIN). This was launched by the UK Secretary of State for the Environment and Chinese Minister of Agriculture in Beijing in 2008 and is a key delivery vehicle for UK-China cooperation on agriculture, food security and environmental sustainability. Relu Director Philip Lowe is a board member of SAIN.
- A session on 'Stakeholder participation in hydrology' was convened by Tobias Krueger of the *Catchment Management for Protection of Water Resources* project team at the European Geosciences Union General Assembly in Vienna..

Influencing Research Council policy and practice

The Relu Programme is a conduit for learning between the Research Councils and other research funders:

- Relu's Briefing Paper 16 Adventures in Science was published and launched during 2011. It identifies the major lessons on interdisciplinarity to be drawn from the programme and can be viewed as a handbook for future research council initiatives. The briefing paper explains the novelty and innovation of the programme and how this has enabled it to succeed in engaging stakeholders and promoting research findings. The briefing paper has been widely distributed across the research councils and to other stakeholders.
- Key presentations by the Relu Director's Office on Relu's approach to interdisciplinary programme management and knowledge exchange have been given to the ESRC Research Committee and to the G8 Heads of Research Assessment.
- The Director's office also made several presentations to and advised many other research programmes, such as QUEST, NERC Natural Hazards, Ecosystem Services for Poverty Alleviation, UK Environmental Observation Framework, and the National Centre for Research Methods. Several meetings have been held with LWEC staff and presentations given to three separate LWEC events on Relu's approach to knowledge exchange and impact analysis. This included an invited address on Knowledge Exchange to 20 NERC/LWEC research programmes at an LWEC Knowledge Exchange Good Practice Event.
- There have been countless requests for advice and information about Relu's methodology for accounting for knowledge exchange and impact, the Stakeholder Impact Analysis Matrix (SIAM).

- Relu is actively feeding into the design of LWEC guidelines for knowledge exchange. The Sustainable Uplands/Learning project has worked closely with the LWEC partnership to identify lessons from Relu that could enhance knowledge exchange and the impact of LWEC accredited research programmes. They have extracted seven principles of effective knowledge exchange and through workshops and consultations are helping prepare LWEC guidelines. Once formally adopted by LWEC, the guidelines will inform the design of all future LWEC activities.
- ESRC's revised research data policy which came into practice during the year, has drawn heavily on Relu experience by introducing the need for data management planning for all grant applications. Relu Data Support Service Manager Veerle Van den Eynden, worked closely with ESRC staff to ensure that valuable experiences of data management planning and data archiving from interdisciplinary projects was incorporated. Research applications will now have to include data management plans when they are submitted to ESRC, and researchers will be expected to make data as openly available as possible for subsequent use.

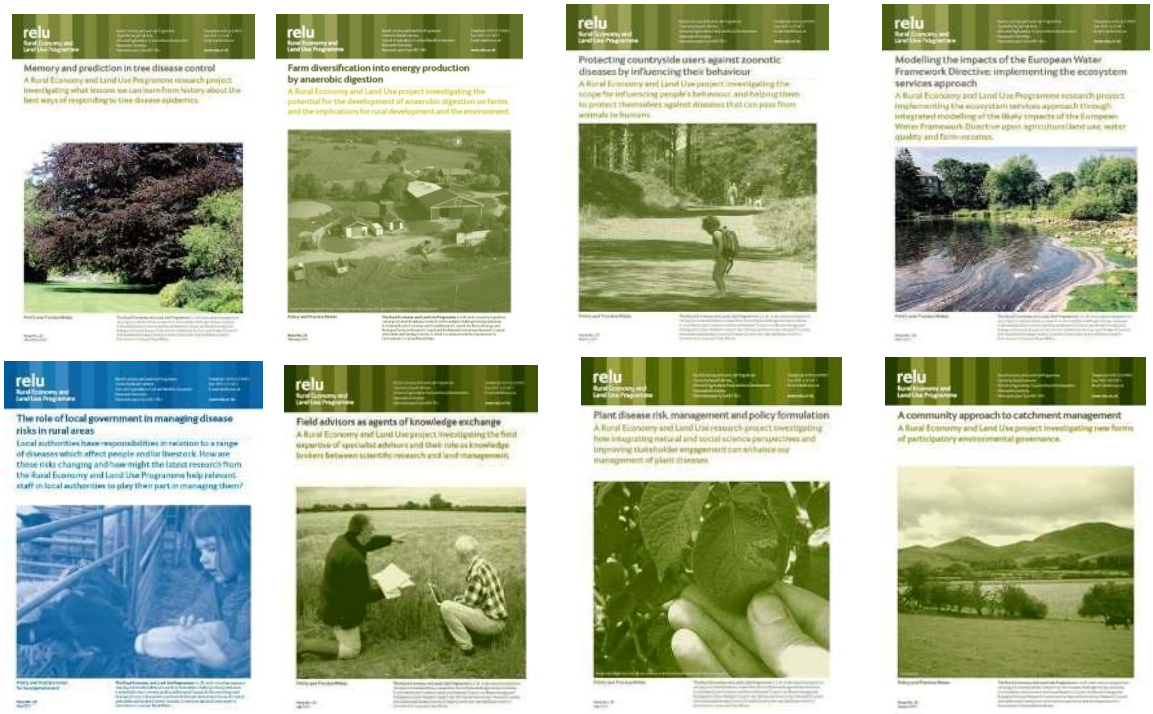
3.8 Key Items of Expenditure

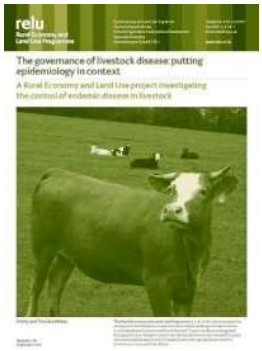
Key items of expenditure include: £9k on *New Horizons for Animal and Plant Disease from the Relu Programme*; and £47k on *Who Should Run the Countryside?*

4. External Communication

4.1 Programme Level Publications

In 2011 Relu published 3 Programme-level briefing documents (nos. 14-16) and an additional briefing paper was published by the Relu Data Support Service. Relu also published 10 Policy and Practice Notes (nos. 25-34 during this period). Publications were distributed to approximately 2400 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. Three briefing papers were launched at the Relu conference in November and provided to all delegates. 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.





The Policy and Practice Note series continued to expand at a rapid rate, with nos. 25-34 appearing during the year:

25 Memory and Prediction in tree disease control
26 Farm diversification into energy production by anaerobic digestion
27 Protecting countryside users against zoonotic disease by influencing their behaviour
28 Modelling the impacts of the European Water Framework Directive: implementing the ecosystem services approach
29 The role of local government in managing disease risks in rural areas
30 Field advisors as agents of knowledge exchange
31 Plant disease risk, management and policy formulation
32 A community approach to catchment management
33 Could protected landscapes have a leading role to play in the sustainable management of natural resources?
34 The governance of livestock disease: putting epidemiology in context

Two notes: "The role of local government in managing disease risks in rural areas" and "Could protected landscapes have a leading role to play in the sustainable management of natural resources?" continued the special series aimed at local authority audiences, with the latter examining the potential for protected areas such as national parks to act as pathfinders for landscape scale management of land and ecosystem services. Relu publications continue to receive positive feedback. For example, several AONBs responded with enthusiasm to Relu's note on Protected Areas (No. 33), eg " I recently received the RELU Briefing Note, and really just wanted to write to tell you how useful it is. ..... this will be a useful document I'm sure and one which we've already shared with colleagues. ....We found your paper well considered, concise and importantly an accurate representation of the issues and opportunities facing AONBs and NPs. It certainly sums up well many of the issues we've been tackling in recent years". Another AONB explained: "There are several issues raised with direct relevance to current developments for the AONB". The Note has been particularly well received in the context of the new Nature Improvement Areas, and has enabled Relu to enter into some fruitful discussions and relationships with partnerships putting forward proposals for NIAs. Relu is now in a good position to feed the latest research into the development of these areas and to promote more effective, landscape-scale management of natural resources.

Three new briefing papers were produced in the Relu series: No 14 "Growing concerns: animal and plant disease policy for the 21st century"; No 15 "Changing landscapes: some

achievements of the Rural Economy and Land Use Programme" and No 16 "Adventures in Science: interdisciplinarity and knowledge exchange in the Relu programme".

"Growing concerns" drew upon evidence from the Relu animal and plant disease projects and built upon the major *New Horizons for animal and plant disease* workshop held in May, which brought together researchers and key stakeholders in dynamic discussions about the issues currently facing the UK. It contains quotes from key figures such as Professor Ian Crute of the Agriculture and Horticulture Development Board, Nigel Gibbens, UK Chief Veterinary Officer and Dr Joan Webber Principal Pathologist at Forest Research.

"Changing landscapes" contains edited entries put forward for the "Best example of impact from a Relu project" in the Relu Awards. It was launched at the "*Who should run the countryside*" conference in November, together with a companion volume published by The Relu Data Support Service, "Innovation in Interdisciplinary Methods – the Relu experience" which showcased entries in the "Best example of innovative methodology" section of the Awards.

The third briefing paper to launch at the conference was "Adventures in Science" which explores some of the innovation at programme level that has characterised Relu. This will be a key learning document for future programmes, outlining how the Director's Office has steered the £25 million initiative and how it has innovated in interdisciplinarity, communications and knowledge exchange.

Relu has continued to achieve coverage in a range of mainstream and specialist publications, with over 200 print, broadcast and on-line news items recorded. These included coverage in The Observer, The Guardian on line, The Yorkshire Post, Aberdeen Press and Journal, Newcastle Journal, NE Business, Farmers' Guardian, Farmers' Weekly, Farming UK, Farm Business, Farming Monthly, NFU Online, Anglersnet, Horticulture Week, Town and Country Planning, RICS Land Journal, Local Government Chronicle, Food Ethics Magazine, Food Safety News, Property Week, and Times Higher Education. There were also several items about Relu research on BBC radio and television and regular features in research council blogs and publications.

One particular highlight was a ground breaking series of six articles by various authors in the Veterinary Record, taking a social science perspective on veterinary practice, informed by Relu. The series explores the role of the profession in UK society and examines some of the issues arising from the Professor Philip Lowe's report "Unlocking Potential: a report on veterinary expertise in food animal production". The series was launched on 17 September 2011 with an introductory article by Anne Liddon, Sue Bradley and Philip Lowe and continued weekly over six issues.

- *Securing the veterinary role in society* by A Liddon, S Bradley and P Lowe, p302-303 17 September 2011
- *Neoliberal reform and the veterinary profession* by G Enticott, P Lowe and K Wilkinson 169 24 September 2011
- *Who or what is a veterinary specialist*? By A Gardiner, P Lowe and J Armstrong 69 p354-356
- *Taking up the public health challenge* by K Clarke and C Jones 169 p 384-385 8 October

- *Veterinary field expertise: using knowledge gained on the job* by A Proctor, P Lowe, J Phillipson and A Donaldson 169, 408-410.
- *The Lowe report and its echoes from history* by A Woods 169, 434-436

A Theme issue of *Philosophical Transactions of the Royal Society B* on 'Interdisciplinary perspectives on the management of infectious animal and plant diseases', was also published (see 3.1).

4.2 Significant Engagement Events

Relu organised and supported a range of engagement events. Particular highlights at Programme level were:

New Horizons for Animal and Plant Disease took place in May 2011 in London, involving around 50 delegates. This represented the culmination of work carried out with the research projects and with a core group of 300 stakeholders, identifying current questions and points where Relu research could contribute to policy development. The core stakeholder group was built up over the course of the third call of research projects and included a Relu Animal and Plant Disease Stakeholder Forum of key individuals who attended regular meetings to hear about the research and to act as a sounding board, providing feedback and real world contexts for the projects' research. The core group has engaged with a succession of events, targeted briefings and synthesised outputs over the last three years. Attending the New Horizons event were researchers from Relu's animal and plant disease projects plus representatives from important stakeholder organisations, including Defra, Fera, Welsh and Scottish Governments, Natural England, NFU, ADAS, RVC and private industry bodies. Its objective was to identify ways in which the research can be applied to policy and practice and to engage with real world questions and problems. Small group discussions focused on six main themes: Who owns disease? How to deal with complexity/uncertainty? How to prioritise resources? How to integrate the evidence? How to change/influence behaviour? How should we re-think disease in the 21st Century? Stakeholders played a pivotal role in identifying and introducing the themes. A different project "hosted" each table, enabling stakeholders to move round the room and engage with a different project on each theme. Rapporteurs assigned to each team recorded the discussions and these fed into Relu's Briefing Paper 14: Growing Concerns: animal and plant disease policy for the 21st century, published in September 2011.

Who should run the countryside? Celebrating the Relu programme and looking ahead at the future of rural areas was a major conference held at The Sage, Gateshead, which attracted over 200 delegates from across the UK. The programme for the day was innovative and aimed to break away from the normal academic conference format. It was structured around three major debates on challenges facing the countryside (food security v environmental responsibility; 21st century land ownership, a responsibility or a privilege and can protecting your countryside save the Earth?) and two panel discussions (Who owns animal health, the farmer or the state and Environmental modelling, master or servant?) complemented by a dozen interactive activities organised by different Relu projects, involving such diverse attractions as an interactive quiz on food safety, a board game about development in the rural urban fringe, computer visualisation of land use and a song and storytelling about uplands futures. Delegates also had an opportunity to view films about the Relu programme and the finalists in the Relu Awards and vote for the best

example of impact and best example of innovative methodology. The day culminated in the awards ceremony (see section 2). Feedback from delegates has been excellent with 98 per cent of respondents rating the day "good" or "excellent". Very positive comments were also forthcoming, for example: "The whole conference was extremely well put together and informative. The different styles of debates and presentations made it really interesting and engaging along with the opportunities to take to presenters and other delegates." "All seemed to work really well. Quality content and speakers with amusing bits thrown in. The organisation team can consider it a very successful event." "The whole day was just so welcoming and open and the principle of communicating to a wider audience beyond 'researchers' was greatly enhanced by the occasion. It is/was a model."

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 100 different stakeholder organisations at the programme level during 2011. Meetings were also held between the Directors' Office and key stakeholders, including Defra, Commission for Rural Communities, Veterinary Public Health Association, various Local Authorities, One North East, Royal Veterinary College, Defra Rural Economy Growth Review and British Society of Animal Science.

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 a member of Natural England's Science Advisory Committee.

Since its inception, Relu has also engaged with stakeholders via several thematic forums. The forums have been used as sounding boards on research programme and project development. They have included key stakeholders from the public, private and voluntary sectors who can represent their organisations and also act as conduits for knowledge transfer. In May 2011 the Animal and Plant Disease Forum members were key participants in the *New Horizons in Animal and Plant Disease* day. 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,

Figure 3: Formal Stakeholder Engagement in Relu at the Programme Level in 2011

Stakeholder	Representation on Programme Management Group or Strategic Advisory Committee	Relu Visiting Fellow or Work Shadowing Host	Attendee at Programme Workshop/Conference
ADAS			√
Agriculture and Horticulture Development Board			√
BASF Plc			√
BBSRC	√		√
Biogen Greenfinch			√
British Society of Animal Science			√
Climate North East			√
Commission for Rural Communities		√	
Community Action Northumberland			√
Community Led Solutions			√
ConFor			√
Country Land & Business Association			√
Countryside Council for Wales	√		√
Defra	√	√	√
Diocese of Newcastle			√
Dumfries and Galloway Food Co-operative			√
Durham County Council			√
Durham Wildlife Trust			√
East Riding of Yorkshire Council			√
East Riding of Yorkshire Rural Partnership			√
English Heritage			√
Environment Agency			√
Environment Agency Wales		√	
EPIC			√
Farmers' Weekly			√
Federation of Cumbria Commoners			√
Food and Environment Research Agency			√
Food and Farming Entrepreneurs Network			√
Ford and Etal Estates			√
Forest Research			√
Forestry Commission England			√
Freelance Farming Journalist			√

G & K Tansey			√
Game & Wildlife Conservation Trust			√
GHK Consulting			√
Groundwork North East			√
Health Protection Scotland		√	
Ian Condliffe Ltd			√
IUCN UK Peatland Programme		√	√
James Hutton Institute			√
Joint Nature Conservation Committee	√		√
Lake District National Park Authority			√
Lanchester Parish Council			√
Lantra LandSkills North East			√
Lincolnshire County Council		√	√
London International Development Centre	√		√
LQR Associates			√
Mark Tatchell Consulting			√
Maslen Environmental			√
Ministry of Defence			√
Monash University			√
National Farmers Union			√
National Trust			√
Natural Capital Initiative			√
Natural England		√	√
NE Communications`			√
NERC	√		√
Nidderdale AONB			√
Norfolk Wildlife Trust			√
North Pennines AONB Partnership			√
North Pennines Dales LEADER			√
North York Moors National Park Authority			√
Northumberland Coast and Lowlands LEADER			√
Northumberland County Council			√
Northumberland National Park Authority			√
Northumbria Water			√
Northwoods/Rural Development Initiatves			√
Patterdale Parish Council			√

P.C. Tinsley Ltd			√
Peak District National Park Authority			√
Plunkett Foundation			√
Promar International			√
Royal Agricultural Society of England		√	√
Royal Institute of Chartered Surveyors		√	√
Royal Parks Richmond			√
Royal Society for Protection of Birds			√
Royal Veterinary College			√
RuCANNE			√
Rural Innovation			√
RuSource			√
Rydale Flood Research Group			√
Scottish Environment Protection Agency			√
Scottish Government	√	√	√
Scottish Natural Heritage			√
Smiths Gore		√	√
Solway Border and Eden RDPE			√
Stockbridge Technology Centre Ltd			√
Sust Dev Com		√	
SWH Surveys Ltd			√
Teesdale Community Network			√
Tweed Forum			√
Tyne Rivers Trust			√
United Utilities			√
Upper Eden Community Plan			√
Veterinary Consultancy Services			√
Veterinary Public Health Association		√	√
Water UK			√
Waterways Partnership			√
Welsh Assembly			√
West Country Rivers Trust			√
Women's Food and Farming Network			√
Woodland Trust			√
Yorkshire Dales National Park Authority			√
Yorkshire Organic Millers			√

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 2011 a particular focus was placed upon Relu's animal and plant disease core stakeholder group (which comprises 200 individuals), for whom 3 events were organised and promoted:

- "Complexities, risks and uncertainties" workshop 21 February 2011
- "New Horizons for Animal and Plant Disease from the Relu Programme", Central London 10 May 2011
- "Assessment of Knowledge Sources in Animal Disease Control conference - Lost in Translation: Living with uncertainty in animal disease management" on the 21 September 2011.

Feedback from Relu's core animal and plant disease stakeholder group showed that respondents found the interdisciplinary approach extremely effective. Stakeholders from policy and business said they found it useful to hear research results and to have the opportunity for discussion and debate. The policy and practice notes were described as "clear and accessible" and the Relu events were popular. Members of the stakeholder forum had found the animal and plant disease forum meetings useful with "interesting and wide ranging discussions" and welcomed the opportunity for private sector participation. Participants in the *New Horizons in Animal and Plant Disease* workshop in May enjoyed the innovative format and the rotation system that allowed them to move around different tables to discuss questions with different teams of academics. Several commented on the value of bringing the issues around animal and plant disease together to allow the two fields to learn from one another.

The Adapting Rural Living and Land Use to Environmental Change projects are joint initiatives with the Living with Environmental Change Programme and provided a second focus for 2011. The projects launched in 2011 and several held stakeholder events which were promoted to a core stakeholder group:

- "Working across the rural urban divide: towards new forms of environmental governance for the rural urban fringe" organised by the Managing Environmental change at the Urban Fringe project 25 January 2011
- Catchment Management and Public Engagement organised jointly by Relu and the Northern Rural Network Tuesday 1 February 2011.
- Collaborative Conservation workshop organised by the Collaborative Conservation in Agri Environment Schemes project 14th July 2011.

- ACES conference conservation conflicts, strategies for coping with a changing world 21-24 August 2011, Aberdeen
- An event on "The Uplands" in Newcastle in partnership with Northern Rural Network to explore the implications of the 2011 Defra Uplands Policy Statement and subsequent developments September 2011
- UK/Ireland Planning Research Conference Relu special session on rural urban fringe 12-14 September 2011, Birmingham University 2011
- Going with the flow: Participatory approaches to river catchment management organised by the Building Adaptive Strategies for Environmental Change in River Catchments project 15th December 2011.

4.4 Work Shadowing and Visiting Fellowship Schemes

By funding placements of between one week and a month, the Relu Work Shadowing Scheme aims to introduce Relu research staff to the action-contexts in which their research may be used. These contexts may be commercial organisations, voluntary bodies or public agencies. The Relu Visiting Fellowship Scheme enables policy makers and practitioners from the commercial, voluntary or public sector to spend between one week and a month visiting Relu research teams with a view to exploring the implications of the research for their work and to raising awareness of their interests among the researchers.

Work shadowing is in its final phase as most of the projects come to an end but two key placements have taken place with Defra: Mark Reed from *Transforming Knowledge for Upland Change* has been taking research on carbon offsetting and peatland restoration directly to policymakers and the project has published three targeted policy briefs; Alister Scott from *Managing Environmental Change at the Rural-Urban Fringe* has met with a range of Defra staff on numerous occasions to discuss the research findings and how they might fit into the Defra agenda. Alister Scott said: "Each of these meetings allowed me to see how Defra staff work across their remit. The focus on the Ecosystems Approach was core to this but it was significant how they worked across some boundaries. In particular through a concerted effort of Defra we were able to set up a joint meeting to discuss how our research work can connect across both agendas. Significantly that meeting led to a useful discussion about the role, purpose and focus of the research which lead to significant developments in the final method. This interchange between Defra and CLG was invaluable and allowed me to see the pressures and limitations but also the keen desire within these agencies to collaborate as far as time allows. This type of cross departmental meeting is a really useful model to apply in research work. The experience was really worthwhile and I feel through our exchanges we have helped each other through the sharing of information and thoughts. The opportunity to participate in meetings, seminars and workshops has enabled me to work with a range of colleagues and appreciate at first hand the pressures and issues facing Defra from the other side of the fence. The importance of the EA is clear and the need to embed this within other thinking and publics is clear. I have been able to build this within our research outputs."

The Visiting Fellowship Scheme has continued to provide links for stakeholders into Relu projects, to the benefit of both. 12 Visiting Fellows were attached to the programme in 2011. Several Fellows commented on the events they attended, including the Relu *Who Should Run the*

countryside conference and one local government fellow said: "The Relu conference in November was interesting and thought provoking, and as such feeds into the advice I give to colleagues." Another observed: "A really enjoyable and vibrant day which Relu organisers can be proud of.....I was able to renew several contacts made during my Relu Fellowship and make one or two new ones." The programme was able to draw on the considerable expertise of Stephen Hunter, Visiting Fellow to the Relu animal and plant disease projects who has a wealth of policy experience from MAFF and Defra and is now working as a freelance consultant. He played a key role by preparing background briefing notes on the findings from six Plant and Animal Disease projects in advance of the *New Horizons for animal and plant disease* which also fed into the Relu Briefing No. 14 *Growing concerns: animal and plant disease policy for the 21st century.* He said*: "*Although I am no longer a senior civil servant with Defra I have been able to maintain links with ex-colleagues in the Plant and Bee Health Service. I will soon be discussing with them how the Relu programme approach of integrating natural science and socio-economic research can be incorporated into their work.....In particular I hope that the work I did on drafting briefing notes ahead of the New Horizons meeting was able to give a flavour of how a policy maker might perceive the findings of the various projects. Such people would tend to take a less academic and perhaps more practical view which would be influenced by their different perspective and experience."

A couple of fellows felt they did not receive as much communication from the projects as they would have liked but most found it a very positive experience. Ian Baker, for example, said: I work with several networks of rural development practitioners and my engagement with Relu as a whole and with this *(Managing Environmental Change at the Rural Urban Fringe*) project have given me a series of points of reference in discussion and forward thinking. Sally Hewitt from Lincolnshire Council was invited to give some reflections on her experience of being a Relu Visiting Fellow at a special Relu session of the UK/Ireland Planning Research Conference in Birmingham on 12-14th September. She said: "I rounded up the session by reflecting on my role as a visiting fellow from practice, the immense scope of Relu and its approach to knowledge transfer, and some of the barriers I perceive to knowledge transfer to stakeholders beyond those directly involved in the knowledge creation. The benefit....was to provide the delegates with an understanding of the unique knowledge transfer and communication elements of the programme and to provide some challenge to the planning academics present as to the barriers to dissemination."

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 35 presentations were given specifically by projects to stakeholders in 2011 (Annex B). Individual research projects ran over 9 stakeholder workshops which engaged a wide range of organisations (see Table 3).

Table 3: Project-Level Stakeholder Workshops in 2011

Project	***Workshop***
RES 240-25-0016 Scott	"Working across the rural urban divide: towards new forms of environmental governance for the rural urban fringe" organised by the Managing Environmental change at the Urban Fringe project 25 January
	UK/Ireland Planning Research Conference. Relu special session on rural-urban fringe. September, Birmingham University.
	The Birmingham Environmental Partnership, Birmingham University, Sustainability West Midlands, Birmingham Chamber of Commerce and Relu held an exploratory workshop to identify green economic opportunities within the Greater Birmingham and Solihull LEP in January. Over 70 delegates from Local Enterprise Partnership attended representing the public, private, research and voluntary sectors. This included Elected Members, senior public sector officers, green business leaders and representatives from the local Chamber of Commerce.
RES 229-25-0015 Wynne/Heathwaite	"Assessment of Knowledge Sources in Animal Disease Control conference - Lost in Translation: Living with uncertainty in animal disease management". Keynote contributions were made by Martyn Jeggo (Australian Animal Health Laboratory), Katinka de Balogh (Food and Agriculture Organisation of the United Nations) and Andrew Stirling (University of Sussex. The conference was held in London at The Royal College of Surgeons of England on the 21st September 2011. The conference audience consisted of approximately 60 policy practitioners
RES 240-25-0019 Franks	Relu's *Collaborative conservation in Agri-Environment Schemes* project held a workshop in July at Newcastle University to discuss preliminary findings and to kick off a dissemination programme. It was attended by representatives from Defra, Natural England, ESRC and other public and private bodies and conservation organisations. Discussion included the possibility of designing collective conservation options and/or introducing another level to the Environmental Stewardship Scheme which would attract not just current ESS participants but also farmers not in ESS.
RES 240-25-0012 Reed	The Relu/LWEC Sustainable Uplands *Transforming Knowledge for Upland Change* project has hosted a workshop for the leading thinkers in knowledge exchange research, bringing together disciplines as diverse as linguistics, education, ecology and psychology to think about what works and doesn't work. The group will be publishing a series of papers, including one on the top research questions for knowledge exchange, and an integrated theoretical model of processes. In the next phase they will test and refine their theory by interviewing knowledge exchange practitioners, researchers and stakeholders across UK uplands. The researchers are working with Relu, LWEC and ESRC to translate their findings into recommendations for funding bodies and researchers. Findings are being integrated into the RCUK's Impact Toolkit.
	ACES conference *Conservation conflicts, strategies for coping with a changing world* August, Aberdeen
RES 240-25-0004 Pain	*Stakeholder views on involvement in academic led research* Workshop led by Louise Bracken, Geoff Whitman and Hariett Bulkeley at Durham University, September. It drew on experiences from across Relu and beyond.
	Going with the flow: Participatory approaches to river catchment management organised by the Building Adaptive Strategies for Environmental Change in River Catchments project 15th December 2011.

4.6 Relevance of Research and Potential Impact

The projects are providing insights of relevance to key policy and practice domains. In 2011 there were 13 new stakeholder research links or networks established, 15 occasions where advice, data, or information was provided to policy makers, 5 submissions to government consultations or inquiries, and 351 businesses trained or advised (see Table 4).

Table 4: Contributions to Policy and Practice in 2011

Strengthening of existing stakeholder-research links or networks	13
Establishment of new stakeholder-research links or networks	16
Submissions to government consultations or inquiries	5
Meetings/occasions where advice, data, or information was provided to policy makers	15
Meetings/occasions where advice, data, or information was provided to businesses	5
Businesses trained or advised	351
Policy makers trained or advised	2
Memberships of stakeholder boards or advisory groups	7
New decision support tools, methods or protocols	0
New material or technological advances	1
Commercialisation: Spin-outs, licences, patents etc.	0
Number of stakeholders temporarily visiting or attached with project	84
Number of researchers work shadowing/placed with stakeholders	4
Number of interactions/events focused on public participation and engagement	2
Number of publications aimed at policy makers	10

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

Anaerobic digesters could increase farm profits
According to Relu's project *Energy Production on Farms Through Anaerobic Digestion*, small-scale energy production on farms could be good for farmers and for the environment. Not only is it economically viable on both arable and dairy farms, but it could reduce the amount of artificial fertiliser applied to the land. Read about it in Relu's Policy and Practice Note no 26.

Catchment management approach catches on
On World Water Day in March Laurence Smith and Kevin Hiscock from the *Catchment Management for Protection of Water Resources* project team presented key findings at the Water Stakeholder Forum organised by Defra in London. They highlighted the components of a template for catchment management, and supporting tools for catchment assessment, planning and knowledge exchange developed by the team including the Ecosystem Health Report Card and Extended Export Coefficient modelling approach. At the Forum, the Parliamentary Under Secretary for Natural Environment and Fisheries, Richard Benyon, announced the adoption of the 'catchment management approach' and explained its role in meeting the goals of the Water Framework Directive while integrating management of flood risk and water abstraction. He launched ten catchment management pilot schemes to be led by the Environment Agency.

Cash for carbon in inquiry evidence
The Environment, Food and Rural Affairs Committee's Farming in the Uplands inquiry cited evidence on the role of peat soils in sequestering carbon and their potential for carbon markets from Relu's *Sustainable Uplands: learning to manage future change* project in their report Farming in the Uplands.

Prevention is better than cure for zoonotic disease
The risk of contracting zoonotic diseases that pass from animals to humans appears to be on the increase in the UK, but encouraging countryside users to take simple precautions to protect themselves is the best response, according to Relu's project *Assessing and Communicating Disease Risks for Countryside Users*. The researchers found that a systematic approach to all the UK's common zoonotic disease risks needs to involve a wide range of people, including the individual land managers and organisations that have responsibility for areas used by the public. At the moment it isn't clear who should take the lead – health professionals or land managers – and although both play an important role, neither group has the whole range of health and environmental expertise needed. But in Relu's Policy and Practice Note No 27, the researchers say that if there were a mechanism to enable them to share knowledge and then draw on that single source, it would be a useful step forward.

A land use strategy for Scotland
Scottish Ministers have laid Scotland's first land use strategy and an accompanying consultation report before the Scottish Parliament. The Strategy signals a change in the ways that land use is approached across the country, and will influence a wide range of land use decisions. Relu's researchers have been involved throughout, contributing evidence to the report, peer reviewing and as members of the expert panel. Relu also commissioned a major report on land use "The Lie of the Land: future challenges for rural land use policy in Scotland and possible responses" which was submitted to the inquiry; and researchers from the *Sustainable Uplands* project spent time with the team who were writing the report.

Tweets on peat
Researchers from the *Sustainable Uplands: transforming knowledge for upland change* project have been experimenting with Twitter as a means of gathering stakeholders' views. They invited people to tweet on the use of peat in horticulture as part of the Defra consultation. Twenty two comments were collated and submitted as part of the researchers' response to the consultation.

Exploring veterinary field expertise at the Royal Veterinary College
Members of Relu's *Science in the Field* project team presented preliminary findings to staff at the Royal Veterinary College in March. *Science in the Field* is exploring the current and potential role of field-level advisors (including vets) as knowledge brokers between scientific research and land management practices. The project focuses on how knowledge and expertise are constructed and disseminated. The team met with Deputy Principal Professor Stephen May and members of teaching and research staff at the RVC to test emerging themes and ideas around the nature of veterinarians' field expertise. The meeting generated lively discussion, with staff providing constructive feedback and comments on the research.

Farmers club hears about potential rewards for environmental services
Joe Morris from Relu's *Integrated Management of Floodplains* project gave a talk to the Commercial Farmers Group in the Farmers Club, London, drawing on research from the Relu and Foresight programmes, and exploring the factors shaping agriculture. He discussed how the review of the Common Agricultural Policy is likely to drive future change and how growth in global markets for foodand bio-energy commodities is likely to increase the incentives for UK farm output. He suggested that while farmers will be required to do more to conserve natural resources and protect the environment, there is scope to reward them for providing specific environmental services, such as carbon storage, flood control and enhanced biodiversity. New knowledge, skills and innovations, whether induced by markets or regulation, will be needed to meet these future challenges. The audience was particularly interested to learn how, in the context of increased demand for food, research can support high performance, sustainable farming. They were also concerned to know how, in practice, famers are to be more comprehensively rewarded for providing environmental services, especially where this involves additional costs or lost opportunities on their part.

Does free global trade pose too many risks?
We face a future of uncertainty, and possible new threats to our food supplies, natural heritage, and even human health, from animal and plant pathogens, according to Relu researchers writing in a newly-published special interdisciplinary issue of Philosophical Transactions of the Royal Society B. They conclude that climate change, the evolution of new pathogens and the tendency for existing ones to develop the ability to infect new hosts, may put us at greater risk from pathogens in the future. But these problems are exacerbated by human behaviour, and understanding this could be key to helping policymakers deal with risk and uncertainty.

Could the European Water Framework Directive benefit towns rather than countryside?
Implementation of the European Water Framework Directive, designed to change agricultural land use – thereby reducing run-off of pollutants into water courses – could achieve significant improvements in water quality, but at the expense of farm incomes. This could have serious economic consequences for the countryside, while it would be the users of urban waterways for leisure who would benefit most according to researchers working on Relu's *Modelling the Impacts of the Water Framework Directive* project. Relu's Policy and Practice Note no 28 explains how the research can help decision-makers to target scarce resources to those areas which will respond most positively to additional spending.

Prized research on lake catchment participation
Relu's *Testing a Community Approach to Catchment Management* project was awarded an "Above and Beyond" Staff Prize by Lancaster University for their initiative in sharing research with stakeholders and the public. They donated the prize of £1000 to the Loweswater Care Project, a group of stakeholders, working to address pollution in Loweswater, that has grown out of their research initiative.

Zoonotic disease – whose problem is it anyway?
Local government has a wide variety of responsibilities relating to livestock and zoonotic diseases, but these are often addressed by a range of different departments and functions within local authorities. With climate change new threats may emerge. Relu's latest policy and practice

note for local authorities: "The role of local government in managing disease risk in rural areas" aims to bring some focus to the way in which local authorities address these responsibilities and draws on the latest research from the programme to inform their strategies.

Research provides evidence for select committees
Evidence submitted by Relu to Government select committees includes *Evidence for the Environmental Audit Committee Inquiry on Sustainable Food*; *(*to which Relu Director Philip Lowe was also called to give oral evidence) a report on *Sustainable Agricultural Intensification – Encapsulating and Motivating Policy Adjustment* by Relu researcher Noel Russell, from the University of Manchester, and a *Submission to the EFRA Committee inquiry into Farming Regulation* compiled for Relu by Land Use Consultant Alan Woods.

Could businesses fund peatland restoration?
There is growing interest in gaining private investment in peatland restoration through carbon markets. The *Sustainable Uplands: Learning to Manage Future Change* project has been developing the evidence base to show how restoration affects carbon storage in peat soils, and considering how we can ensure such work doesn't compromise the other benefits uplands provide. Their latest policy brief considers ways to overcome regulatory hurdles and argues that it may be possible to make this a reality via corporate social responsibility.

Research feeds into policy on National Ecosystem Assessment
Many Relu researchers made significant contributions to the National Ecosystems Assessment. During March and April Ian Bateman, who led Relu's *Modelling the Impacts of the Water Framework Directive* project, made presentations on the NEA to ministers and senior civil servants at a series of events leading up to its publication. Audiences included Caroline Spelman, Secretary of State for the Environment, and other government ministers, Sir John Beddington, Government Chief Scientist, government scientific advisers and senior officials. Publication of the report stimulated a considerable amount of media coverage.

Research contributes to Government Growth Review
Relu and the Centre for Rural Economy, Newcastle University collaborated to compile a substantial response to the Government's Growth Review on Rural Economies, drawing on evidence from across the Relu programme indicating the important role of rural areas as incubators and catalysts for sustainable growth.

What makes an expert field advisor?
Field advisors build up their expertise in complex ways, and fulfil an important role linking research and practice according to Relu research project *Science in the Field*. They don't simply transfer knowledge from other experts, but combine and repackage information, drawing on their own accumulated field experience and tailoring it to the needs of individual farmers. See Relu Policy and Practice Note no 30 for more details.

Reshaping the management of animal and plant disease
Shouldn't policymakers be looking at the fundamentals in animal and plant disease, learning lessons and exchanging information across both of these fields and involving stakeholders at every stage? That has always been the Relu approach and you can read about some of the

outcomes in "Growing Concerns: animal and plant disease policy for the 21st century" which takes a fresh look at the problem in the light of research from across the programme.

Researchers respond to House of Lords call for evidence
Laurence Smith and colleagues from Relu's *Catchment Management for Protection of Water Resources* have submitted a report to the House of Lords Inquiry into Freshwater Policy which may be read on the Relu website. Could National Parks and other protected areas be environmental test beds for landscape-scale cooperation amongst farmers? This was one of the questions up for debate at a joint Relu/ Northern Rural Network event in September, where Relu's latest local government policy and practice note on the role of protected areas was launched.

Livestock sellers should provide more information about disease risk, say researchers
Relu researchers from the *Governance of Livestock Disease project* say that anyone purchasing livestock should be fully informed about the health status of the herd from which they are purchasing and about any known risks. If provision of this data were mandatory, they say, any such risks would drive down prices. Thus, farmers would have a much greater incentive to eliminate disease in their herds. Read more about it in Relu's policy and practice note no 34.

Working together to improve the local environment
The Big Society makes much of involving local people in addressing environmental problems in their area. But can this really work in practice, when the problems are as complex as the algal blooms that were disfiguring the picturesque lake of Loweswater? Researchers from Relu's *Testing a Community Approach to Catchment Management* project worked alongside non-scientists to show that this kind of approach can bring people together, with a sense of common purpose, to make a real difference. The group that developed - "The Loweswater Care Project" - was able to bring a varied range of skills and expertise to the problem, which result not only in some environmental improvements, but also useful lessons for policymakers, outlined in Policy and Practice Note 32.

Relu stakeholder experience feeds into new think tank
Wyn Grant who led Relu's *The Role of Regulation in Developing Biological Alternatives to Pesticides* and was a co investigator on *The Governance of Livestock Disease* was asked to address the inaugural meeting of a new think tank, the Institute for Animals and Social Justice, in London on 30 June and to talk about the experience of stakeholder engagement in the Programme.

Landscape scale proposals spark debate
Relu's Policy and Practice Note 33: "Could protected landscapes have a leading role to play in the sustainable management of natural resources?" has provoked considerable interest, particularly amongst aspiring Nature Improvement Areas. In December Terry Carroll who wrote the policy and practice note for Relu was invited to take part in a ministerial round table seminar on the uplands with Defra Minister Jim Paice and selected representatives from statutory and third sector organisations. He was also asked to contribute to a panel debate at an English National Parks Association workshop on sustainable development.

Lords discuss rural economy
In November Sir Howard Newby, Chair of Relu's Strategic Advisory Committee organised an event for interested peers to discuss aspects of the rural economy, hosted by Lord Wade. Assistant Director Jeremy Phillipson gave a presentation about the achievements of the Relu programme and there were contributions from David Raffaelli on ecosystem services and Terry Marsden on rural planning.

Games planners play?
The battle to protect the green belt and the countryside can now be fought out on a board game which Relu researchers from the *Managing Environmental Change at the Rural Urban Fringe* project have developed as a decision-making teaching tool. Rufopoly is an interactive game that enables people to journey through the fictitious county of Rufshire which is under constant change from new pressures for development within the region's growing population. The game was showcased at Relu's "Who should Run the Countryside?" conference in November.

Uncovering the mysteries of stakeholder engagement
A foundation of active knowledge exchange is now seen as essential to getting research into policy and practice but do we know how this works? "Stakeholder Engagement and Knowledge Exchange in Environmental Research", by Jeremy Phillipson, Philip Lowe, Amy Proctor and Eric Ruto and published in the Journal of Environmental Management, (95 (1), 56-65 published 2012) reports on a survey regarding the involvement and perceived impact of over a thousand stakeholders in Relu research.

POSTnote on animal disease cites Lowe report
The Parliamentary Office of Science POSTnote 392 examining disease threats to UK livestock, outlines prevention and control measures, and looking at factors likely to contribute to future disease, and cites the report "Unlocking potential: a report on veterinary expertise in food animal production" by Relu Director Philip Lowe.

4.7 Press and publicity

Relu has again achieved regular coverage across all the different types of media, including trade, mainstream national, regional and local newspapers, web news resources, radio and television (Annex B). As well as news coverage, professional and trade journals such as the RICs Land Journal, Local Government Chronicle and Town and Country Planning have featured articles written by Relu researchers and by Relu's Director and Science Communications Manager. The Veterinary Record showcased a groundbreaking series of articles on social science and the veterinary profession authored by Relu researchers. Relu has also been featured in research council publications including ESRC's Britain in 2011 and the Global Food Security website.

4.8 Key Items of Expenditure

Key items of expenditure include: £9k on the conference *New Horizons in Animal and Plant Disease*; £47k on *Who should Run the Countryside;* £17k on Briefing Papers; £28k on Policy and Practice Notes; £2.5k on work shadowing and visiting fellowships; and £3k on UK networking/liaison meetings.

5. Progress of Projects

All of Relu's 94 projects (including 34 small seed corn projects and 39 large research projects), 16 PhD studentships and 5 interdisciplinary research fellows started prior to the reporting period. Of these all seed corn projects, 24 large research projects and 6 studentships were completed prior to the reporting period. Seven research projects completed their work in 2011 and 1 studentship. Nine projects were current on the Adaptation of Rural Living and Land Use to Environmental Change. Seven 4th call projects and one large second call project will be completed in 2012

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 received

RES-227-25-0010 Dr J Bullock, CEH Dorset
01 Oct 06 - 31 Mar 12
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.

The final round of farmer interviews has now been fully transcribed. Quantitative data have been extracted and entered in to an SPSS database for analysis. Manual extraction techniques are being employed to analyse the qualitative data. The final bird surveys were done in early 2011 and all ecological data were entered onto the database. The team has developed methods to use the qualitative social data in the quantitative analyses of the ecological outcomes and informed scoring of farmer types has proved very effective in explaining agri-environmental outcomes. Further stakeholder events are scheduled for 2012 and planning for these is well underway. Results are still preliminary, but analyses of the social and ecological data suggest a common story. Bird, bee and butterfly responses to agri-environment options are explained well by the quality of the habitat created (e.g. flower abundance or seed quantity), by local weather conditions and by very large-scale regional differences. Habitat quality of agri-environment options differs among farms and is partly explained by the local environment (e.g. soil type), but also by the farmers themselves. The experience of the farmer in environmental management is positively associated with the quality of habitats produced. The social data also suggest that the experience of the farmer strongly explains their attitude to and confidence in carrying out agri-environmental management. Training might be expected to have a positive impact, by increasing the effective experience of the farmer, and the research does indicate positive social responses to training. But the results also show only small impacts of training on environmental outcomes, suggesting that there are no quick-fix solutions to improving agri-environmental outcomes.

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'.

The project's findings were summarised in the 2010 Programme Annual Report.

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 project's findings were summarised in the 2010 Programme Annual Report.

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.

The project's findings were summarised in the 2010 Programme Annual Report.

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 project's findings were summarised in the 2010 Programme Annual Report.

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.

The project's findings were summarised in the 2010 Programme Annual Report.

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 project's findings were summarised in the 2010 Programme Annual Report.

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 was investigating how to extend the scientific and social accomplishments of innovative catchment management programmes in the USA, and other European countries to the UK. The aim was to derive a catchment management 'template' 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.

Water pollution poses difficult challenges for policy, control strategies and scientific assessment. This project aimed to investigate how best to integrate and extend the scientific and social accomplishments of innovative catchment management programmes in the USA, Australia and other European countries to catchments in the UK. This built on the work of Capacity Building Award RES-224-25-0031 which successfully formed a network of researchers and water professionals capable of investigating integrated solutions for water resources protection. The project conducted an international comparative analysis of catchment programmes with a focus on collaborative governance, local coordination and action, and tools for assessment, planning and knowledge exchange. Two catchments in England were investigated as case studies against which international lessons were tested: the River Tamar and the River Thurne. The project researched the current issues, water quality targets, pollution mitigation potential and governance systems in these two catchments. Results were integrated with the findings of the wider comparative study of governance arrangements, leading to the 'template'. There was also a higher level international analysis of land and water governance regimes, and of the transferability of policies, approaches and measures. A survey was conducted of collaborative governance in England and Wales, including the emergence of community-based catchment groups. For the 'template' key components are an adaptive management approach, collaboration between agencies and levels of government and a 'twin-track' of deliberative partner and stakeholder engagement supported by scientific research. Programmes are best built from existing organisations and partnerships, centred on those with current management responsibilities, and working within the framework of prevailing law that facilitates partnership arrangements and appropriate delegation. Integrated land and water management involves local responsibilities and requires inclusive deliberation at local level under the framework of multi-level government. Thus locally acceptable responsibilities and rights must be translated from higher level regulation, with provision for inter-locality cooperation and coordination. Meaningful public participation can integrate environmental and public health criteria with economic and social goals, whilst catchment assessments, programme design and implementation are enhanced by local knowledge, acceptance and ownership. Locally trusted technical providers are needed for capacity building and advisory work, not least with farming communities. Their essential functions include convening and mediating to foster trust,

collaboration and co-production of knowledge. Capacity is needed for assessment of the condition of water resources and comprehensive planning. Monitoring of processes and outcomes is essential. Successful collaborative programmes require a shared knowledge base, skilled intermediaries, and high quality communication and decision-support tools. In meeting this need in the English case study catchments the project developed an Ecosystem Health Report Card and an innovative participatory and interdisciplinary modelling approach that enabled collective framing of the scale and severity of selected water quality problems. The higher level analysis showed that the EU, USA and Australia have seen a discernible shift from top-down, hierarchical modes of governance of natural resources towards more networked forms, based on collaborative linkages and interactions between multiple actors and levels. In each case the shift endorses arguments for more collaborative public management of land and water. However, arrangements also differ. Both the EU and the USA still exhibit strong elements of hierarchical, vertical control and increased consultation and sharing of tasks does not necessarily equate to greater sharing of responsibility and decision-making. One explanation for this divergence is how federal multi-level governance is manifested in each context. The three jurisdictions exhibit different approaches to federalism and the variation in institutional, legal and political structures shapes the degree of collaboration occurring in water governance. This variation limits the scope to transfer organisational and institutional lessons from one jurisdiction to another, although catchment level techniques and tools transfer more readily. Several lessons emerge from the project's survey of collaborative catchment governance in the UK. An expansion of both community-based and state-led initiatives has been evident and information was compiled concerning capacity, funding, institutional profile and activity.

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 has been investigating how stakeholders perceive the risks of E.coli and how we can reduce the risks of people becoming infected.

Escherichia coli O157 is a micro-organism that causes illness in humans (1246 UK cases in 2010) and is commonly found in the guts and faeces of cattle and sheep where it causes no disease. There are a particularly high number of cases in young children and in rural areas. The pathways through which humans can become infected include: contact with farm animals and their faeces, contaminated food, consumption of water from an untreated supply and person to person transmission. The symptoms of human disease include stomach pain leading to bloody diarrhoea (dysentery) leading to kidney failure in 5-10% of cases and occasionally death. There have been a number of major outbreaks in the UK (e.g. Godstone petting farm and Central Scotland outbreak) which have further brought this pathogen to prominence. The overall aim of the project was to provide the evidence to ensure that rural policies minimise the risks to communities from *E. coli* O157. This was implemented through seven work packages focussing on two study areas (North Wales and the Grampian region of north-east Scotland). The study areas included important farming (i.e. cattle and sheep) areas, with countryside used widely by both visitors and residents for leisure and also had different levels of disease (Grampian has 4

times as many cases per head of population compared with North Wales). The main findings of the research were obtained through a variety of social and natural science methods.
A questionnaire of farmers, rural visitors and residents found that:

- People think about protecting themselves indoors (e.g. cleanliness, food and home) rather than outdoors
- Awareness is highest in farmers particularly in the Grampian region and lowest in visitors to the two areas
- Most (83%) identified *E. coli* O157 as a severe disease however a relatively high proportion of farmers in Grampian (25%) described it as mild
- Knowledge of symptoms was similar between groups but vomiting was frequently described as a symptom and this is not usually the case for *E. coli* O157. Antibodies from blood and saliva were measured to give an estimate of exposure and potential immunity of individuals to this pathogen. Results showed that there were a relatively high percentage of people with antibodies (12%) but the levels were not found to be higher in Grampian.

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 was 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.

Overall, the project has provided a framework for taking an inclusive approach to risk analysis, regulation and governance for plant diseases and scenario planning to help inform the national response to plant disease epidemics.
Specific aims were to;

i. Develop a conceptual framework for the analysis of risks to plant health, including a detailed review and historiography of plant disease epidemics in the UK and beyond as informed by comparative studies elsewhere.
ii. Forecast the risk and potential impacts of food and non-food plant diseases on land use and the UK rural economy.
iii. Examine the routes of infection and spread for plant diseases specific to food and non-food plants through trade activity and by natural transmission.
iv. Examine the environmental and socio-economic impacts of specific food and non-food plant diseases in selected agriculture/horticulture sectors and land based industries in the UK, including an assessment of alternative disease management strategies on individual stakeholders and community behaviour.
v. Provide an overall evaluation and a generic framework for taking a holistic approach to risk analysis, regulation and governance in relation to plant disease epidemics.
vi. Disseminate and transfer the findings in a novel manner through media channels (including film) in addition to conventional publications and appropriate events.

The project team has built and interacted with an extensive network of stakeholders taken from all levels of the production supply chain, processing, retailing, support industries, NGOs, Government Departments, research organisations, other RELU projects and the general public.

More than 100 academic and non-academic stakeholders have attended a series of workshops run by the team, including one workshop that brought together practitioners, academics and policy makers from both animal and plant disease constituencies. Initial work focused on creating a sound project framework based on a review of relevant literature and an analysis of historical data on UK plant epidemics. This created appropriate UK crop maps, examined structural change in each sector since 1950s, established disease typologies (food/non-food crop, based on modes of spread, whether largely through human activity in trade, or more natural dispersal mechanisms) and developed an overall conceptual framework for risks to plant health and governance. Using members of a project Advisory Board, scenarios were built that examined the impact of plant diseases (food and non-food) on land use and the UK rural economy. Following on from this, in depth interviews in each of three food sectors (potato, wheat and mushrooms) were conducted with sixty eight key 'actors' in these sectors to understand how risks are measured, perceived, interpreted and managed throughout the production chain for specific diseases. Of these, 60 semi-structured in-depth interviews were conducted with growers and other supply chain actors in the cereal and potato sectors. Outputs suggest that plant disease is a controllable production risk for growers. Wheat and potato growers favour high-yielding varieties demanded by millers and supermarkets respectively, even if risk is increased. This situation could change if Directive 91/414, with its focus on 'hazard' rather than 'risk', is activated in its current proposed form, emphasising the importance of 'risk as politics'. Disease is not considered a major risk to 'downstream' actors in the wheat and potato supply chains. For them, key risks revolve around volatile prices and supplies. Initiation of contracts between contractor and grower ensures that most risk is passed to growers, even though key downstream actors influence growers' choice of varieties. Choice experiments (CE) using a sample of 323 members of the public with respect to and willingness to pay (WTP) for reductions in pesticides for bread, potatoes and a rose bush as payment vehicles reveal the public are WTP a small premium to avert human illness and to stop the decline of bird species by reducing pesticide use on potatoes and roses respectively. A model was created investigating the effect of crop consultants wrongly estimating the fungicide dose response curve in cereal production in combination with attitude to risk. We were able to investigate which aspect of the consultants' decision-making process (disease prediction or attitude to risk) has the largest effect on yield and financial losses.

RES-229-25-0015 Professor B Wynne, Professor L Heathwaite, Lancaster University
01 Jul 08 – 01 Nov 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.

The management of human and animal health or the health of the environment does not, and cannot, rely on one discipline or a single group of experts. Where disease is concerned, it requires containment strategies in order to prevent further spread. Management has to require

and interplay between scientific knowledge, social and environmental criteria rather than a single expert group. In managing these complex situations and making informed decisions, limitations in understanding of the research, policy and stakeholder communities are exposed. For those concerned with animal disease events there is a pressing need to develop an effective cross-disciplinary understanding of strategies of containment. This is the issue at the heart of the project. The overall aim was to break down these disciplinary barriers by creating a truly cross-disciplinary understanding of the problem. There were two main objectives: To bring together natural and social science approaches to analyse the complexities and uncertainties embedded in animal disease management strategies and to use a cross-disciplinary approach to evaluate why particular research and technical developments have been adopted and others not, in the deployment of strategies of containment. The first objective is based on the assumption that the scientific knowledge upon which decisions are made contains inherent uncertainties and that when science is translated into policy, these uncertainties are often overlooked. Such uncertainties include a lack of understanding of the complexity of the problem particularly a poor understanding of the interaction between different disciplines and a lack of sufficient data. Central to this objective is advancing our understanding of different types of uncertainties, their complexity and significance and how this knowledge can be translated into improved management practices and policy. The second relates not only to techniques and equipment, but also to the related skills, resources and knowledge that are employed during animal disease management. The researchers designed their programme to examine a range of practices covering detection, identification, modelling and emergency response. The aim was to understand the goals and evaluate the tools used to integrate these practices and how they might be brought together to provide more effective measures to manage disease outbreaks. A core deliverable is an understanding of disease containment to indicate how knowledge of the uncertainties could be communicated better in the process of translating knowledge from research to policy, in order that more robust preventative and responsive strategies of containment can be implemented and are available in the future. They also explored issues of scale, when moving from a regional and national context, to an international context. Three diseases were explored: Cryptosporidiosis (a disease that can affect drinking water quality), foot and mouth disease (an animal disease where the response for containment is well documented) and avian influenza (where failure of containment could cause pandemic disease in humans). The results were formulated as key messages:

- An interdisciplinary perspective represents a strong strategic opportunity to improve animal disease management.
- Communication of uncertainties is challenging - especially between sectors (e.g. between the policy sector and the livestock industry).
- New technologies including devices, techniques and associated skills, can provide solutions but may add complexity and new forms of uncertainty if implemented.
- Issues of scale can occur when moving to broader/higher authorities/legislative bodies (e.g. from the UK to Europe). This can increase complexity and difficulties for maintaining trust.
- The processes that shape the prioritisation of disease management options and foci lack transparency; they also vary with reference to human and/or animal health and by different organisations. This can impair coordinated responses to managing disease risks.

- The perception and understanding of uncertainties can vary dramatically between different stakeholders; for example between scientists, policy makers and industry. This in turn leads to the emergence of divergent agendas and priorities in managing disease.
- Institutional memory is important in the translation of knowledge from science to policy.
- Actual disease events, such as the 2001 FMD outbreak or widespread contamination of public water supplies by Cryptosporidium, remain by far the strongest influences for change.
- Trust in authorities needs to be enhanced. Problematic decisions or policy implementation lives long in the memory of stakeholders, creating cynicism or lack of appetite for new legislation or uptake of novel guidelines.

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 project's findings were summarised in the 2010 Programme Annual Report.

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.

The project's findings were summarised in the 2010 Programme Annual Report.

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 explored 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.

Changes in recent decades, including shifts in the objectives for agriculture, new priorities for rural development and environmental conservation, and new institutional and regulatory frameworks, have introduced greater complexity to the contemporary 'land system', influencing the ways in which environmental knowledge is produced and translated into professional expertise and practice. With the privatisation and restructuring of agricultural extension services there has been a proliferation of specialised knowledge providers for farming and other types of rural land management expertise. What is not understood are the knowledge practices of those experts who now mediate between institutional science, rural policy and land management practitioners.

The research sought to redress this gap by investigating 'field-level advisors' within three case study professions - rural vets, applied ecologists and land agents/surveyors. The project explored the current and potential role of field-level advisors as knowledge brokers or intermediaries between scientific research and land management practice, with a focus on how their knowledge and expertise are constructed and disseminated. The objectives were to:

- Review concepts of knowledge exchange and the notion of field-level advisors as
- knowledge brokers;
- Understand the knowledge systems and requirements that underpin the different
- types of field-based expertise and how these adapt to scientific advance and to the
- changing rural economy;
- Consider the approaches to knowledge exchange adopted by the different field-based
- specialists and their current and potential role as knowledge brokers between
- scientific research and land management practice;
- Explore how land managers differentiate between different forms of field-level expertise.

The findings provide a number of new insights into the nature of field-level expertise and the workings of the contemporary advisory landscape. Advisors undoubtedly act as intermediaries bringing science to farms. However research agendas have become disconnected from technical dissemination capacities, and vice versa. So, whilst advisors look to their professional bodies to filter and synthesise the latest research findings, this is unevenly done across the professions. Moreover, the relevant rural professional associations are marginal to public research decision making. The findings highlight the need to improve knowledge exchange between the professions and research base. More generally, the research has helped to understand processes of knowledge exchange taking place between research and practice. This included the development and testing of a novel experimental tool, the Stakeholder Impact Analysis Matrix (SIAM), which provides a method for analysing how research projects are engaging stakeholders and has widely influenced the Research Councils' thinking on mapping and assessing the impact of research projects and programmes. There is a disjuncture between the conventional understandings of knowledge exchange and brokerage and the actual experience of encounters between research, field advisors and land managers. The findings revealed the complexity of field advisors' knowledge sources and how formal CPD provision and requirements do not fully reflect the range of ways advisors keep their expertise up to date. Advisors were found to be actively brokering a range of different types of knowledge, besides formal science, crucially including generating knowledge themselves through learning on-the-job. Both experiential and experimental knowledge are pivotal to their work. Yet they are given limited recognition and generally undervalued by both professional and training organisations.

Advisors develop their knowledge through interactions with other professionals, from within the same profession and between professions, as well as land managers. The results highlight the significance of inter-professional working. In an arena where professionals are obliged to work together and learn from each other, advisors need to be better prepared to understand the inter and intra-professional contexts in which they will have to operate. Furthermore, through their client/professional encounters, advisors and land managers do not simply exchange knowledge but learn mutually from each others' knowledge practices. In this way, they also co-construct one another and produce new knowledge. A feature of the exchanges between farmers, scientists and professionals is the way in which the polarity between expert and inexpert may be reversed. In fact, both advisors and land managers develop expertise in knowing when and how to play the 'expert inexpert' as part of their interactions. Broader transformations of state-extension relations have been emulated by parallel changes within the professions in terms of their relations to the regulatory state. Land agents have increasingly found themselves at the meeting point where the regulatory state meets rural landed property, while ecologists and other environmental advisors have accrued increasing status in rural land management and regulation. In the case of the veterinary profession the research highlights an erosion of the traditionally close relationship with the state with the application of neoliberal management techniques to the governance of animal health.

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 Jan 12
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.

End of award report due soon

RES-240-25-0006, Prof W Sutherland, University of Cambridge
01 Nov 10 – 31 Jan 12
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.

End of award report due soon.

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.

End of award report due soon

RES-240-25-0012, Dr Mark Reed, University of Aberdeen
01 Oct 10 – 31 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.

End of award report due soon

RES-240-25-0016, Dr Alister Scott, Birmingham City University
01 Jul 10 – 29 Feb 12
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.

End of award report due soon

RES-240-25-0018, Mr Laurence Smith University of London
01 Oct 10 – 30 Sep 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.

End of award report due soon

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.

Agri-environmental schemes (AES) are voluntary schemes in which farmers agree to manage the environment in return for compensation for their loss of income and other direct costs. The overwhelming number of AES contracts are arranged on a farm-by-farm basis. However, the effectiveness of their conservation activities is in part dependent of the conservation activities of neighbours. Therefore, this study examined the different styles of landscape-scale collaboration that could be incorporate into AES to improve their effectiveness, and the species that could be expected to benefit from a landscape-scale perspective. A literature review found evidence for data on the spatial use for 54 of 92 key farmland species (identified through a combination of species protection status, conservation lists and general ecology). Of these 54, 22 had home and/or foraging ranges that operated at scales larger than the typical English farm (based on the typical size of a farm of uniform shape, this is conservatively estimated to be a distance greater than 1 km). It is therefore concluded that landscape-scale management is likely to benefit these species.

Consideration of the styles of collaboration farmers would support within AES is based on three data sources: a telephone interview, case study research and an on-line consultation, to identify;
(i) the problems faced by farmers currently involved in collaborative options, and how these were overcome,
(ii) attitudes of farmers towards collaborative AES (cAES), and
(iii) the implications of responses for the design of cAES.

Telephone interviews were conducted with 18 agreement holders who opted to include option HR8 "Supplement for Group Action" into their Higher Level Scheme (HLS) Environmental Stewardship Scheme agreement (ESS). The problems they identified were similar to those anticipated by case study interviews with 33 farmers and responses from 122 contributors to an on-line consultation. This is encouraging from the perspective of cAES schemes as it shows that anticipated problems are not insurmountable, at least to the satisfaction of Natural England, Defra and the European Commission. The case study interviews showed barriers to cAES to include (i) a lack of communication and mutual understanding between farmers; (ii) a cultural imperative for independence and timeliness, and (iii) alternative interpretations of risk amongst farmers. However, the study concluded that if designed appropriately, cAES have the potential to overcome concerns that farmers hold about the existing. It is suggested that any cAES is likely to be more successful where:
(1) It does not require the whole farm to be entered into a scheme. This will allow farmers greater flexibility and choice over which parts of the farm they would like to include in a scheme, and ELS participation should not be a pre-requisite for entering a cAES as this will encourage participation by current AES non-participants.
(2) Farmers are involved in the design of the scheme and there are established communication channels for their ongoing involvement, with opportunities to provide feedback.
(3) The scheme is flexible in initial design and adaptable to changing circumstances in its ongoing management. Farmer involvement in the scheme will facilitate this, although it will be essential to strike a balance between ecological needs and farmers' desires for flexible management.
(4) A cAES is locally specific and targeted at a known species or habitat of interest. A scheme needs to have a demonstrable problem and clear aims, which can be facilitated through education and mutual learning.

(5) As well as a clearly defined problem and aims the scheme should also work towards clearly demonstrable benefits. To this end, the scheme should include monitoring and reporting towards the achievement of the objectives, which will allow farmers to monitor their own success and feel a sense of satisfaction in their involvement in the scheme.
(6) The scheme should be seen to reduce rather than increase risk. This will be facilitated by providing an alternative income stream that is seen as complementing rather than competing with income generated by food production, contractually insulating farmers from financial penalties associated with the actions of others, and by providing long-term, but flexible support.

The on-line consultation identified one additional requirement, a need for collaboration for environmental benefits to be discusses more widely among farmers, because few respondents had previously considered such an option. The survey of HR8 agreements also identified that an intermediary, overseeing organisation played an important role facilitating these collective agreements. These organisations helped communicate scheme details and implications to farmers and assisted in bringing farmers together to allow them to discuss views openly. The studies identified two "styles" of collaboration; 'active' and 'passive'. 'Active' collaboration can be considered as requiring 'positive integration and interaction' between farmers in their farming operations, for example co-ordinated the cutting of grass and cereal crops with neighbours. If this form of co-operation were introduced into AES there would have to be legally enforceable safeguard of each collaborator's liabilities – farmers would have to be confident that they remained responsible for the conservation activity undertaken on their own land, and would not be liable to penalties due to shortcomings of other members of collaborative agreements. 'Passive' collaboration more closely resemble 'co-ordination' rather than active integration and interaction, for example, in the placement of hedges (so they join-up with neighbours' hedges (or other environmental features) to form and/or extend corridors), placement of buffer zones around high environmental valuable sites which may be on their neighbour's property, and to locate ponds in strategic locations as dictated by environmental features in the landscape (to create stepping stones to assist the movement of target species). 'Passive' co-ordination appears to be the form of collaboration farmers would be most willing to support. This could occur within the current farm-by-farm contractual framework, subject to overview of an organisation with responsibility for integrating each farm's submissions into a landscape-scale environmental plan. Farmer support could be facilitated by developing an intermediary organisation, such as a conservation NGO or Natural England, to play the role of Honest Broker to facilitate negotiations between farmers. Such an organisation can help inform farmers of the opportunities of participation in collaborative options and schemes.

RES-240-25-0020, Dr Elizabeth Oughton Newcastle University
Aug 10 – Jan 12
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.

End of award report due soon

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.

End of award report due soon

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's findings were summarised in the 2010 Programme Annual Report.

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 project's findings were summarised in the 2010 Programme Annual Report.

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.

This project was inspired by Defra's commitment to promoting the wider use of Farm Health Planning (FHP), an activity that brings vets and farmers together in the active measurement, management and monitoring of livestock health. It aimed to situate FHP within a broader history of efforts to prevent livestock disease through an activity known as veterinary preventive medicine.
Objectives were:
1. To produce an analytical, historical account of the developing concern for and expertise in livestock disease prevention, which illuminates how, with reference to the changing scientific, agricultural and policy contexts, vets, farmers, scientists and government officials problematised and addressed impediments to production, and with what effects.
2. To provide a critical, historically-informed analysis of current policy-making on FHP which situates its subjects, objects and processes within social, scientific, economic and political context.
The project has recommendations regarding the future framing, implementation and evaluation of FHP. Due to constraints of time, and limitations of the existing literature, the project focussed largely (though not exclusively) on the period 1942-75, and on pig production.
Publications from the project: provide an overview of state involvement in veterinary preventive medicine. This is situated within a broader context of 20th century changes in the diseases suffered by British livestock, and the ways in which they were perceived and managed; provide a more detailed analysis of the post-WWII drive to extend the provision of preventive medicine to British farms, mainly from the perspective of the veterinary profession; focussing on pig production, examine the disease targets and goals of mid-20th century preventive initiatives. The project also explored how and why – in relation to agricultural practices, policies and the economy – disease demographics changed over time, together with the veterinary conceptualisation of health and disease. Outputs directed at Defra and the veterinary profession, situate 21st century FHP within a longer context of preventive efforts, and draw lessons for its present and future applications. They put into historical perspective the recommendations for more FHP, made by Prof Philip Lowe in his 2010 report *Unlocking potential: A report on veterinary expertise in food animal production*. Other specific outputs used the historical analogy of the 1960s Newcastle Disease (ND) vaccination campaign to draw lessons for Defra's current attempts to encourage blue tongue virus (BTV) vaccination by farmers.

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.

End of award report due soon

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.

End of award report due soon.

6. Key Performance Indicators

The Tables present the Key Performance Indicators for Year 8 of the Programme. All indicators and measures were satisfactorily achieved or exceeded.

Table 5: Performance Against KPIs, 2011

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 2011 was on: (a) preparation of a special profile of *Philosophical Transactions of the Royal Society* (Section 3.1); (b) leading a major event on *Who Should Run the Countryside?* (Section 4.2); and (c) delivery of 15 keynote speeches (see Annex A)
1.2 Relu applications and awards	Over 17% EOA reports rated outstanding and less than 10% rated problematic[1]		PMG to report
1.3 Refereed journal articles	Number in 2011		25 articles were published in 2011 by ongoing projects (Annex B).
1.4 Conference papers	Number in 2011		35 conference papers/presentations were given by Relu researchers on ongoing Relu projects, including 15 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 contributions to its research	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). A briefing paper reflecting on Relu's approach to interdisciplinary programme management was published.
2.2 Facilitation of inter-disciplinary training and advice		No specific training opportunities planned	

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

opportunities			
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		Hold major event for animal and plant disease projects and major programme conference	Two major programme-wide events organised: New Horizons in Animal and Plant Disease, which actively engaged key stakeholders in discussion with Relu researchers and resulted in Briefing Paper 14 Growing Concerns: Animal and Plant Disease Policy for the 21st century Who Should Run the Countryside? Which was focused on major debates, panel discussions, interactive events and stakeholders voting for finalists in the Relu awards. All contributed to high profile engagement of stakeholders
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		1 work shadows and 6 visiting fellowships set up and completed	2 work shadows and 12 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	Individual projects made substantial inputs into several policy domains (Section 4.6). Evidence submitted by Relu to Government committees includes: Evidence for the *Environmental Audit Committee Inquiry on Sustainable Food* to which Relu Director Philip Lowe was also called to give oral evidence and a report was submitted on *Sustainable Agricultural Intensification – Encapsulating and Motivating Policy Adjustment* by Relu researcher Noel Russell; a Submission to the *EFRA*

			Committee inquiry into Farming Regulation compiled for Relu by Land Use Consultant Alan Woods; oral evidence by Laurence Smith from *Catchment Management for Protection of Water Resources* project, to the House of Lords Agriculture, Fisheries and Environment EU Sub-Committee inquiry into *EU Freshwater Policy*; and a submission to Defra's *Rural Economy Growth review* led by Relu Assistant Director Jeremy Phillipson
3.5 Project Comms and Data Management Plans	To be completed 3 months after start of award	Oversee preparation of PCDMPs	All PCDMPs submitted previously
3.6 Media coverage of research and outputs		Number press releases issued	The Director's Office issued 16 press releases in 2011. Coverage of Relu research in national, local and trade media has continued to grow, with over 200 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	3 programme briefing papers were prepared and distributed by the Director's Office and a fourth was produced by Relu-DSS. 10 policy and practice notes were published (Section 4.1). 15 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 2011.
3.9 Relu Newsletter		4 newsletters prepared and distributed	4 newsletters were prepared and distributed to the Relu mailbase.
4. Research Capacity and Training			
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) No commissioning activity during the year	a) No commissioning activity during the year	Relu Director's Office has met with Relu Evaluation team
6.2 Applicants and Award holders		a) Provide telephone and email advice to applicants and award holders	a) Regular contact was maintained with all award holders through joint planning meetings, individual site visits and frequent e.mail correspondence advice.
6.3 Annual Report		Prepare annual report for 2010, 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 event for animal and plant disease projects and major programme conference	Two major programme-wide events organised: New Horizons in Animal and Plant Disease; and Who Should Run the Countryside? Additionally the Director's Office actively encouraged inter-project linkages (Section 3.7).

7. Forward Look

Activities for 2012 are planned as follows:

- Two policy and practice notes still to be produced from previous projects: (Wynne/Heathwaite and Bullock)
- Selection of policy and practice notes from 4th wave projects
- Policy and practice notes drawing on evidence across the programme, including some for specific audiences: eg for Nature Improvement Areas, Payment for Ecosystem Services
- Continue to produce quarterly electronic newsletter distributed to Relu mailbase of 2000 stakeholders covering all projects up to March 2013.
- Launch Relu on Twitter
- Orchestration of programme responses to key stakeholder and policy consultations
- Further dissemination of existing publications and information materials

8. Budget Matters and Co-funding

There are no matters of concern to report.

ANNEX A: PROGRAMME CHRONOLOGY 2011

Month	Programme Events	Project Start/End Dates and Visits
Jan 11	**Lesson learning:** ESRC Research Committee, RIBA, London. Presentation on *"The Relu Programme: Fostering Interdisciplinarity and Knowledge Exchange"*	
	Invited address: Interdisciplinary Masterclass: Leadership training for Interdisciplinary Environmental Initiatives, University of Edinburgh. Presentation on *"Relu and Interdisciplinarity"*	
	Stakeholder meeting: Meeting with Dirk Pardoel, Commission for Rural Communities to discuss Relu Visiting Fellowship, Newcastle	
	Meeting with Peter Hetherington, Guardian journalist, to give an update on current rural socio-economic research for potential future media coverage, Newcastle	
	ESRC Director's meeting, London	
Feb 11	**Lesson Learning:** Skype meeting with Sarah Connell, QUEST Programme	End date project RES-229-25-0012 *Reducing E coli Risk in Rural Communities* Strachan, Aberdeen End date project RES-229-25-0013 Assessing the Potential Rural Impact of Plant Disease (Mills), Harper-Adams Meeting with North East project PIs to discuss November conference, Newcastle.
	"Impact 360: Success Stories from the Sustainable Urban Environment", Sustainable Urban Environments ISSUES conference**,** London	
	Stakeholder meeting: Sixth meeting of Relu/ Local Authorities Steering Group, Newcastle.	
	Stakeholder meeting: Frances Rowe, One North East, Relu Visiting Fellow, Newcastle	
	Invited address: *Reducing greenhouse gas emissions from agriculture: meeting the challenges of food security and climate change*", Royal Society, London. Presentation on *"UK Agriculture and Climate Change: Socio-Legal Perspectives"*	
	"Catchment Management & Public Engagement" Relu/Northern Rural Network Short Course, Newcastle University	
	Relu/LWEC Sustainable Uplands *"Transforming Knowledge for Upland Change",* York	

Mar 11	SPRU / Royal Society Workshop *"Challenges in Policy Relevant Interdisciplinary Science"*, Royal Society, London	
	Defra's Secretary of State Launch of the "Uplands Policy Review", Newton Rigg College, Cumbria	
	Stakeholder meeting: Relu's *Science in the Field* project meeting with Royal Veterinary College, London	
	Dinner with Duke of Edinburgh at Buckingham Palace to discuss the rural economy	
	Invited address: *Reducing greenhouse gas emissions from agriculture: meeting the challenges of food security and climate change*", Royal Society, London. Presentation on *"UK Agriculture and Climate Change: Socio-Legal Perspectives"*	
	Lesson learning: Teleconference with NERC/LWEC to address lessons from Relu	
	Lesson learning: Meeting with UK Environmental Observation Framework, Newcastle	
Apr 11	**Invited Address:** *"Food Security - Challenges and Opportunities for Animal Science",* University of Nottingham, organized by British Society of Animal Science, BBSRC Animal Science Forum, World Poultry Science Association (UK Branch) and the Association for Veterinary Teaching and Research Work. Presentation on *"UK Agriculture and Climate Change".*	Meeting with Project 240-25-0004 *Building Adaptive Strategies for Environmental Change in River Catchments* (Pain) to discuss November conference, Newcastle.
	Lesson learning: Teleconference with NERC Natural Hazards Programme. Presentation on *"The Relu Experience".*	
May 11	*New Horizons for Animal and Plant Disease from the Relu Programme* workshop**,** Regents College, London	Pre-meeting with Relu PIs attending *New Horizons for Animal and Plant Disease from the Relu Programme* workshop
	Invited Address: Cardiff University Lecture Series, Cardiff. Presentation on '*Why social sciences should engage with natural sciences*'.	Meeting with Relu Data Support Service, Essex.
	Oral evidence to the House of Commons Environmental Audit Committee Sustainable Food Inquiry, London	
Jun 11	**Invited Address:** *"Engaging Academic Social Scientists in Government Policy Making and Delivery"*, British Academy, London. Presentation on *'Promoting links between researchers and government'*	

	Global Food Security and Foresight Workshop, Mary Sumner House, London	
	Lesson Learning: Teleconference with Ecosystem Services for Poverty Alleviation (ESPA) to discuss data management issues	
	Invited Address: LWEC meeting on *"Integrated Research and Decision-making for the Land: Scope for Development of a Joint Approach to Knowledge Exchange"* Defra, London. Presentation on *"Lessons for KE from Relu"*	
Jul 11	Natural England Science Advisory Committee meeting, London	End of Project 240-25-0019 workshop *Collaborative Conservation in Agri-Environment Schemes* (Franks),
	Lesson Learning/Invited Address: NERC/LWEC "*Knowledge Exchange Good Practice"* event, Royal Institution, London. Presentation on *"The Relu Programme: Fostering Knowledge Exchange"*	
	Lesson Learning: Meeting with Ken O'Callaghan, LWEC	
	Invited Address: International conference *"Interdisciplinary progress in environmental science and management",* Newcastle. Presentation on "*Ordering knowledge: A response to G. W. Trompf's "The classification of the sciences and the quest for interdisciplinarity"* and lead discussant on "*Dilemmas in interdisciplinarity"*	
Aug 11	*"Conservation Conflicts"* interdisciplinary conference, Relu Sponsored Event at Aberdeen Centre for Environmental Sustainability, Aberdeen Arts Centre	
Sept 11	**Stakeholder Meeting:** High Level Expert Panel (HLEP) for the Rural Economy Growth Review (REGR), Defra, London.	End date project RES-240-25-0019 *Collaborative Conservation in Agri-Environment Schemes* (Franks), Newcastle End date project RES-24-25-0020 *Flood Management in Borderlands* (Oughton), Newcastle End of project workshop RES-229-25-0015 *Assessment of Knowledge Sources in Animal Disease Control* (Wynne/Heathwaite), London.
	Meeting with Owen Dowsett and Peter Stephenson, ESRC, Swindon.	
	Uplands Policy Review and the Role of National Parks, Northern Rural Network seminar, Newcastle University. Launch of Relu Policy and Practice Note 33 "*Could protected landscapes have a leading role to*	

	play in the sustainable management of natural resources?"	
	Lesson Learning: Meeting with Sam Hoste, British Society of Animal Science, to discuss Relu Knowledge Exchange and links to bioscience.	
	Stakeholder Meeting: Rural Economy Growth Review, Evidence Assurance Session, Defra, London.	
	"Stakeholder views on involvement in academic led research" Relu sponsored workshop, Durham University	
	UK Ireland Planning Research Conference, Birmingham. Relu session *"Managing Environmental Change at the Rural-Urban Fringe"*	
Oct 11	Meeting with Peter Gingold of Tipping Point to discuss their planned event in Newcastle In February 2012 and potential cooperation on future projects.	End of project 240-25-0006 *Linking Evidence and Policy for Managing Biodiversity in the Agricultural Landscape* (Sutherland), Cambridge
	Invited address: National Centre for Research Methods "*What is knowledge? What role does user engagement, co-production and impact play?"* , British Academy, London. Presentation on *"Knowledge Exchange for Impact: Perspectives from the UK Research Councils' Rural Economy and Land Use Programme"*	
	New Challenges & Opportunities Facing Marine Fisheries Science, London	
Nov 11	**Invited address:** Rural Economy discussion and lunch, House of Lords, London. Presentation on *"The Rural Economy and Land Use Programme: Adventures in Science".*	End of project 229-25-0015 *Assessment of Knowledge Sources in Animal Disease Control* (Wynne/Heathwaite), Lancaster End of project 240-25-0004 *Building Adaptive Strategies for Environmental Change in River Catchments* (Pain), Durham
	Invited address: European Commission conference on Axis 4 of the European Fisheries Fund. Presentation on "*Local fisheries governance and territorial development*", Brussels.	
	NERC Knowledge Exchange Network, Cambridge	
	Invited address: G8 Heads of Research Assessment meeting, London. Presentation on *"Accounting for Knowledge Exchange and Impact"*	
	Relu Strategic Advisory Committee , Newcastle	
	"Who should run the countryside", Relu Conference, SAGEGateshead	
	Launch of Rural Growth Review, London	

Dec 11	Visit of Laura Meagher to discuss Relu Evaluation, Newcastle	
	Social Media Training Workshop, Newcastle	
	Lesson Learning: Meeting with Sam Hoste, British Society of Animal Science, to discuss Relu Knowledge Exchange and links to bioscience.	
	Invited session: NERC Knowledge Exchange Event**,** London. Presentation on *"SIAM"*	
	Going with the flow: Participatory approaches to river catchment management, Durham. Workshop run by "Building Adaptive Strategies for Environmental Change with Land Use Managers" project	

Annex B: EXAMPLES OF PUBLICATIONS

Carslake, D., Grant, W., Green, L.E., Cave, J., Greaves, Keeling, J.M., McEldowney, J., Weldegebriel, H. and G. F. Medley (2011) 'Endemic cattle diseases: comparative epidemiology and governance' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Chandler, D., Bailey, A.S, Tatchell, T., Davidson, G., Greaves, J. and W.P. Grant (2011) 'The development, regulation and use of biopesticides for integrated pest management' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Clarke, K.A.and C. D. R. Jones (2011) 'Taking up the public health challenge' *Veterinary Record* October 8, 384

Cross, P., Edwards-Jones, G. and Rigby, D. (2011) 'Eliciting expert opinion on the effectiveness and practicality of interventions in the farm & rural environment to reduce human exposure to Escherichia coli O157' *Epidemiology and infection*, FirstView: 1-12, September.

Davies, A. (2011) 'Long-term approaches to native woodland restoration : palaeoecological and stakeholder perspectives on Atlantic forests of Northern Europe' *Forest Ecology and Management* 261(3) 751-763

Dobson, A.D.M., Randolph, S.E. and Taylor, J.L. (2011) 'Tick (Ixodes ricinus) abundance and seasonality at recreational sites in the UK : hazards in relation to fine-scale habitat types revealed by complementary' *Ticks and Tick-borne Diseases* 2(2) 67-74

Enticott, G., Donaldson, A., Lowe, P., Power, M., Proctor, A.and K. Wilkinson (2011) *The changing role of veterinary expertise in the food chain* Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Fish, R., Austin, Z ., Christley, R., Haygarth, P.M., Heathwaite, L.A., Latham, S., Medd, W., Mort, M., Oliver, D.M., Pickup, R., Wastling, J.M.and Wynne, B. (2011) 'Uncertainties in the governance of animal disease: an interdisciplinary framework for analysis' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Grant, W.P. (2011) 'Policy aspects of regulation' in Ehlers, R-U. *Regulation of biological control agents* Springer, Amsterdam.

Harwood, T.D., Tomlinson, I., Potter, C. and J. Knight (2011) 'Dutch elm disease revisted: past, present and future management in Great Britian' *Plant Pathology*, Vol 60 (3), pp.545-555.

Jones CDR, Hunter C, Williams AP, Strachan NJC, Cross P (2011) 'Escherichia coli O157: comparing awareness of rural residents and visitors in livestock farming areas'. *Epidemiology and Infection* 139, 1522-1530.

Lowe, P., Phillipson, J., Green, L.E., Hunter, S., Jeger, M.J., Poppy, G.M. and Waage, J. (eds) (2011) Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Marcu, A. and Uzzell, D. (2011) 'Making sense of unfamiliar risks in the countryside : the case of lyme disease' *Health and Place* 17(3) 843-850

Mills, P., Dehnen-Schmutz, K., Ilbery, B., Jeger, M., Jones, G., Little, R., MacLeod, A., Parker, S., Pautasso, M., Pietravalle, S.and D Maye (2011) 'Integrating natural and social science perspectives on plant disease risk, management and policy formulation' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Moslonka-Lefebvre, M. et al (2011) 'Networks in plant epidemiology : from genes to landscapes, countries and continents' *Phytopathology* 101(4) 392-403

Posen, P., Hutchins, M., Lovett, A. and Davies, H. (2011) "Identifying the catchment size at which robust estimations of agricultural land use can be made, and implications for diffuse pollution modelling" *Applied Geography*, 31(3), 919-929

Potter, C., Harwood, T., Knight, J.and I Tomlinson (2011) 'Learning from history, predicting the future: the UK Dutch elm disease outbreak in relation to contemporary tree disease threats' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Quilliam RS, Williams AP, Avery LM, Malham SK, Jones DL (2011) 'Unearthing human pathogens at the agricultural-environment interface: a review of current methods for the detection of *E. coli* O157 in freshwater ecosystems'. *Agriculture, Ecosystems & Environment* 140, 354-360.

Quine, C.P., Barnett, J., Dobson, A.D.M., Marcu, A., Marzano, M., Moseley, D., O'Brien, L., Randolph, S.E., Taylor, J.L. and DUzzell (2011) 'Frameworks for risk communication and disease management: the case of Lyme disease and countryside users' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Selfa, T., Fish, R. and M Winter (2011) 'Farming livelihoods and landscapes: tensions in rural development and environmental regulation' *Landscape Research*, 35 (6), 595-612.

Strachan, N.J.C., Hunter, C. J., Jones, C. D. R., Wilson, R. S., Ethelberg, S., Cross, P., Williams, A. P., MacRitchie, L., Rotariu, O. and D. Chadwick (2011) 'The relationship between lay and technical views of Escherichia coli O157 risk' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Tiffin, R. and Arnoult, M. (2011) 'The public health impacts of a fat tax' *European Journal of Clinical Nutrition* January.

Winter, M., Chadwick, D., Hodgson, C., Oliver, D.M., Fish, R. And Heathwaite, A.L. (2011) 'Catchments, sub-catchments and private spaces: scale and process in managing microbial pollution from source to sea' *Environmental Science and Policy*, 14(3), 315-326

Woods, A. (2011) 'A historical synopsis of farm animal disease and public policy in twentieth century Britain' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

Woolhouse, M. (2011) 'How to make predictions about future infectious disease risks' Relu Theme Issue of Interdisciplinary perspectives on the management of infectious animal and plant diseases, *Philosophical Transactions of the Royal Society B*, Volume 366, Number 1573.

PRESS AND PUBLICITY 2011

January 2011		
	RuSource newsletter	*Shaping Nature* Relu briefing paper *Big Society* Relu policy and practice note 6 January 2011
	Science Daily webnews	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://www.sciencedaily.com/releases/2011/01/110124095200.htm
	E!science news	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://esciencenews.com/sources/science.daily/2011/01/24/uk.landscapes.could.be.risk.another.major.tree.epidemic.say.researchers
	Backyardnature.net	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://www.backyardnature.net/rss_biol.php
	Habitat	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://www.habitat.org.uk/news1.htm
	Web2news	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://web2news.com/biodiversity
	News.cell.com	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://news.cell.com/story.php?title=uk-landscapes-could-be-at-risk-of-another-major-tree-epidemic-say-researchers
	Feedmyscience.com	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://feedmyscience.com/news/UK+landscapes+could+be+at+risk+of+another+major+tree+epidemic,+say+researchers
	Openscience	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://www.openscience.gr/el/aggregator/2009/12/30/appstore-expense-monitor-ouch?page=8
	NYDailynews	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://www.nydailynews.com/topics/ScienceDaily+LLC
	Letsgogardening news website	*UK landscapes could be at risk of another major tree epidemic*, 24 January 2011 http://www.letsgogardening.co.uk/News.htm
	Wattstreeconsultancy website	*UK landscapes could be at risk of another major tree epidemic*, 24 January 2011 http://www.wattstreeconsultancy.co.uk/news/
	App.feedinformer	*UK landscapes could be at risk of another major tree epidemic, say researchers* 24 January 2011 http://app.feed.informer.com/digest3/T4R35A0EX9.html
	RCUK web news	*The Big Society –helping communities take action* http://www.rcuk.ac.uk/kei/Engaging/larci/news/Pages/home.aspx 26 January 2011
	Farm Business	*Research could help local authorities engage residents in Big Society* 26 January 2011 http://www.farmbusiness.cc/news.asp?section=248&newsid=8843
	Medical News Today	26 January 2011 *inauguration of Vet dev council* ref Lowe report http://www.medicalnewstoday.com/releases/214812.php
	BVA News	26 January 2011 *inauguration of Vet dev council* ref Lowe report http://www.bva.co.uk/newsroom/2279.aspx
	RSN online	*Join Big Society, councils urged* 26 January 2011 http://www.rsnonline.org.uk/Community/Join-Big-Society-councils-

		urged.html
	Smallestnpp	*The Big Society – helping communities take action* 26 January 2011 http://www.smallestnpp.eu/news.htm
	RuSource	Briefing 1214: *Memory and prediction in tree disease control* 27 January 2011
	Meat Trade News	*UK NFU look at vets* – Lowe report http://www.meattradenewsdaily.co.uk/news/270111/uk___nfu_look_at_vets_.aspx 27 January 2011
	RTPI newsletter	*Shaping the nature of England* – Relu briefing paper http://www.rtpi.org.uk/item/3875&ap=1 28 January 2011
February		
	Horticulture Week	*Study says taxpayers should be willing to fund pest control measures* 4 February 2011 http://www.hortweek.com/news/1052853/Study-says-taxpayers-willing-fund-pest-disease-control-measures
	Horticulture Week	*Study finds that response to disease in 1970s is useful today* 7 February 2011 http://www.hortweek.com/news/login/1053701/
	LARCI newsletter	*Policy and practice notes for local government* February 2011 http://www.rcuk.ac.uk/kei/Engaging/larci/news/Pages/home.aspx
	Global Food Security blog	*Kind words butter no parsnips* posting by Philip Lowe 21 February 2011 http://www.foodsecurity.ac.uk/blog/index.php/2011/02/kind-words-butter-no-parsnips
	Radio Scotland	*Mark Reed interviewed* on news item about project's Twitter consultation on peat 25 February 2011
	NorthSound Radio	*Mark Reed interviewed* on news item about project's Twitter consultation on peat 25 February 2011
	LGA website	*Research could help local authorities engage residents in big society* P&P note http://www.lga.gov.uk/lga/core/page.do?pageId=15432252
March		
	Global food security blog	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://www.foodsecurity.ac.uk/news-events/news/2011/110304-anaerobic-digestion-farms-turn-agriculture-green.html
	NFU online	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://www.nfuonline.com/News/AD-on-farms-could-turn-agriculture-green/
	Science Daily	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://www.sciencedaily.com/releases/2011/03/110304091456.htm
	LWEC website	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://www.lwec.org.uk/news-archive/2011/04032011-relu-press-release-anaerobic-digestion-farms-could-turn-agriculture-green
	Farm Business	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://www.farmbusiness.cc/news.asp?section=248&newsid=9147
	Littlegreenfootballs .com	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://littlegreenfootballs.com/page/240080_Anaerobic_digestion_on_farms_c
	Houston Chronicle	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://topics.chron.com/topics/Anaerobic_digestion
	Earth and climate news journal	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://feeds.insanejournal.com/earth_climate/
	Publicservice.co.uk	*Anaerobic digestion could bring farmers one step closer to self-sufficiency* 4 March 2011 http://www.publicservice.co.uk/news_story.asp?id=15680

	Team tangora twitter feed	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://twitter.com/TeamTangaroa
	Scientific computing	*Anaerobic digestion on farms could turn agriculture green* March 2011 4 March 2011 http://www.scientificcomputing.com/news-anaerobic-digestion-on-farms-could-turn-agricultur-030411.aspx
	Webaraza Kenyan farming webnews	*Anaerobic digestion on farms could turn agriculture green* 4 March 2011 http://webarazafarmer.com/index.php?option=com_content&task=view&id=249&Itemid=28
	News site of all party on group ag sci	*Anaerobic digestion on farms could turn agriculture green* http://www.appg-agscience.org.uk/news.html 4 March 2011
	SDRN newsletter	*Agricultural diversification into energy production by anaerobic digestion* 7 March 2011 http://www.sd-research.org.uk/post.php?p=1281
	Ethical Spider.com	*Anaerobic digestion on farms could turn agriculture green* 20 March 2011 http://ethicalspider.com/blog/science-2/anaerobic-digestion-on-farms-could-turn-agriculture-green/
	RuSource news briefing	*Anaerobic Digestion* – Relu P&P note 10 March 2011
	Yorkshire Post (Country Week)	*Manure's value as a source of energy* 14 March 2011 Relu anaerobic digestion project
	Sustainable Guernsey website	*Anaerobic digestion on farms could turn agriculture green* 11 March 2011 http://www.sustainableguernsey.info/blog/2011/03/anaerobic-digestion-on-farms-could-turn-agriculture-green/ *http://www.sustainableguernsey.info/blog/tag/rural-economy-and-land-use-programme/*
	Yorkshire Post web news	*Manure's value as a source of energy* 12 March 2011 Relu anaerobic digestion project http://www.yorkshirepost.co.uk/news/country-view/farming/manure_s_value_as_a_source_of_energy_1_3171258
	Historyscoper	*Anaerobic digestion on farms could turn agriculture green* 24 March 2011 http://historyscoper-sci-tech-blog.blogspot.com/2011/03/anaerobic-digestion-on-farms-could-turn.html
	Crops Review	*Anaerobic digestion on farms could turn agriculture green* 27 March 2011 http://www.cropsreview.com/crop-farming-blog.html
	Monte de Trabalhos	*Anaerobic digestion on farms could turn agriculture green* 30 March 2011 http://montedetrabalhos.blogspot.com/2011/03/anaerobic-digestion-on-farms-could-turn.html
	The Crop Site	*Anaerobic digestion on farms could turn agriculture green* March 2011 http://www.thecropsite.com/articles/779/ad-on-farms-could-turn-agriculture-green
	Science Daily	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://www.sciencedaily.com/releases/2011/03/110330094151.htm
	Grandrapidscity.com	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://grandrapidscity.com/news/articles/prevention-is-better-than-cure-for-zoonotic-diseases
	eScience News	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://esciencenews.com/sources/science.daily/2011/03/30/prevention.better.cure.zoonotic.diseases
	Cell DNA news aggregator	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://news.cell.com/story.php?title=prevention-is-better-than-cure-for-zoonotic-diseases
	Farm Business	Prevention is better than cure for zoonotic disease 31 March 2011 http://www.farmbusiness.cc/news.asp?section=248&newsid=9387

	Regator.com	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://regator.com/p/248483364/prevention_is_better_than_cure_for_zoonotic_diseases/
	Backyardnature.net	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://www.backyardnature.net/rss_biol.php
	Friendfeed.com	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://friendfeed.com/joethetick/acf08696/prevention-is-better-than-cure-for-zoonotic
	Hii.co	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://hii.co.il/notice/50440
	News-medical.net	*Simple precautions can protect against zoonotic diseases* 31 March 2011 http://www.news-medical.net/news/20110331/Simple-precautions-can-protect-against-zoonotic-diseases.aspx
	Medica.de	*Prevention is better than cure for zoonotic diseases* 31 March 2011 http://www.medica.de/cipp/md_medica/custom/pub/content,oid,33255/lang,2/ticket,g_u_e_s_t/mcat_id,7877/local_lang,2/~/Prevention_Is_Better_Than_Cure_for_Zoonotic_Diseases.html
	Medicalnewser.com	*Prevention is better than cure for zoonotic disease* 31 March 2011http://www.medicalnewser.com/prevention-is-better-than-cure-for-zoonotic-diseases.html
	Topix.com	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://www.topix.com/health/lyme-disease/2011/03/prevention-is-better-than-cure-for-zoonotic-diseases
	Biotechmashup.com	*Prevention is better than cure for zoonotic disease* 31 March 2011 http://www.biotechmashup.com/beta/Biology/Prevention_is_better_than_cure_for_zoonotic_diseases
	The Cattle Site	*AD on farms could turn agriculture green* March 2011 http://www.thecattlesite.com/articles/2683/ad-on-farms-could-turn-agriculture-green
	The Bioenergy Site	*AD on farms could turn agriculture green* March 2011 http://www.thebioenergysite.com/articles/887/ad-on-farms-could-turn-agriculture-green
	Tripwire (RTPI WMids mag)	*Managing Environmental Change at the Rural Urban Fringe* March/April issue p11
April		
	Digg.com	*Anaerobic digestion on farms could turn agriculture green* 1 April 2011 http://digg.com/news/business/anaerobic_digestion_on_farms_could_turn_agriculture_green
	Techmag daily	*Prevention is better than cure for zoonotic diseases* 2 April 2011 http://www.techmagdaily.com/prevention-is-better-than-cure-for-zoonotic-diseases.html#
	RuSource	*People and zoonoses* 7 April 2011 http://www.arthurrankcentre.org.uk/projects/rusource_briefings/rus10/994.pdf
	Yorkshire Post	*MP hails plan to protect town from further flooding ordeals* 28 April 2011
	Tripwire RTPI W Midlands Magazine	*Capturing Institutional memory: the case of the rural urban Fringe worksho*p by Alister Scott p11 March/April 2011
May		
	Anglersnet	*Implementing the European Water Framework Directive could drive some farmers out of business* 3 May 2011 http://www.anglersnet.co.uk/News/water-framework-directive-relu-2011.html
	Farm Business	*Implementing the European Water Framework Directive could drive*

		farmers out of business 3 May 2011 http://www.farmbusiness.cc/news.asp?section=248&newsid=9617
	AECC web news	*Implementing the European Water Framework Directive could drive farmers out of business* 3 May 2011 http://www.aecomunicacioncientifica.org/es/noticias/alphagalileo/90488.html
	ClickGreen webnews	*Improving water quality could drive farms out of business* 4 May 2011 http://www.clickgreen.org.uk/analysis/general-analysis/122217-improving-water-quality-could-drive-farms-out-of-business.html
	Farming Monthly	*Implementing the European Water Framework Directive could drive farmers out of business* 4 May 2011 http://www.farmingmonthly.co.uk/
	Yorkshire Post	*River clean-up bill is running into billions* Country Week p5 7 May 2011 http://tinyurl.com/6xj5y34
	RuSource	*Impacts of European Water Framework Directive* 12 May 2011
	RuSource	*Local government and rural disease* 19 May 2011
	Radio York	*Adam Tomlinson Morning Show* Interviews with Caroline Spelman and Mike Potter about Pickering bund scheme http://www.bbc.co.uk/iplayer/episode/p00gndcz/Adam_Tomlinson_19_05_2011/ 1.05 to 1.13 19 May 2011
	Plunkett Weekly News	*More rural areas to benefit from flood defences* Pickering scheme 20 May 2011
	Yorkshire Post	*Dry weather high on agenda as minister visits flood defences* Pickering scheme 20 May 2011 *http://www.yorkshirepost.co.uk/news/country-view/farming/dry_weather_high_on_agenda_as_minister_visits_flood_defences_1_3393154*
	Malton & Pickering Mercury	*Extra cash for flood protection* p 5 25 May 2011 and on-line 29 May 2011 http://www.maltonmercury.co.uk/news/environment/extra_cash_for_flood_protection_1_3417168
	Town and country Planning	*The Rural Urban Fringe Forgotten Opportunity Space*? By Alister Scott and C Carter May/June 2011 231-234
June		
	Food Ethics Magazine	*Consuming Natural Value* article by Henry Buller on ecology in food production systems, citing Relu research p21-22, Summer 2011 volume 6 issue 2
	POSTnotes	*Parliamentary POSTnote 380 Landscape of the Future* 8 June 2011 http://www.parliament.uk/business/publications/research/post/
	BBC Radio 4	*Today Programme* item on Pickering scheme 2 June 2011 2h 33 to 2h 42 http://www.bbc.co.uk/iplayer/episode/b011jvlr/Today_02_06_2011/
	RICS Land Journal	*Catching the blight* by Clive Potter and Anne Liddon p6-7 and *Uplands in the balance* by Mark Reed and Klaus Hubacek p16-17 June-July 2011
	Food Security website	*Management of diseases vital to our food security* http://www.foodsecurity.ac.uk/news-events/news/2011/110609-n-management-of-diseases-vital.html 9 June 2011
	LWEC website	*Greater risk of pathogens with increasing global trade* *http://www.lwec.org.uk/news/2011/june/greater-risk-pathogens-increasing-global-trade* 9 June 2011
	Local Gov Chronicle	*Pathogens, parasites and public health* by Anne Liddon on LG P&P note 9 June 2011
	Science Daily	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* *http://www.sciencedaily.com/releases/2011/06/110609083226.htm*

	RSShog.com	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://rsshog.com/a/is-free-global-trade-too-great-a-threat-to-food-supplies-natural-heritage-and-health-qKKJDD.htm
	NewsCell.com	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://news.cell.com/story.php?title=is-free-global-trade-too-great-a-threat-to-food-supplies-natural-heritage-and-health
	Microbiology news site	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://microbiology.edx.co/?p=3073
	100Meds.com	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://100meds.com/kroger_pharmacy/blog/uncategorized/is-free-global-trade-too-great-a-threat-to-food-supplies-natural-heritage-and-health/
	VRZone	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://forums.vr-zone.com/science-feeds/1423062-free-global-trade-too-great-threat-food-supplies-natural-heritage-health.html
	BackyardNature.net	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://www.backyardnature.net/rss_biol.php
	Farm Business	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://www.farmbusiness.cc/
	Farmers Guardian	*Free global trade may threaten out food supplies 9 June 2011* http://www.farmersguardian.com/home/latest-news/free-global-trade-may-threaten-our-food-supplies/39558.article
	eScience news	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://esciencenews.com/sources/science.daily/2011/06/09/is.free.global.trade.too.great.a.threat.food.supplies.natural.heritage.and.healt h
	Rshogg.com	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://rsshog.com/a/is-free-global-trade-too-great-a-threat-to-our-food-supplies-natural-heritage-and-health-qrmdPm.htm
	Silobreaker.com	*Is free global trade too great a threat to our food supplies, natural heritage and health? 9 June 2011* http://www.silobreaker.com/is-free-global-trade-too-great-a-threat-to-food-supplies-natural-heritage-and-health-5_2264628180918730937
	Iamtheeye.com	*Is free global trade too great a threat to our food supplies, natural heritage and health? 10 June 2011* http://iamtheeye.com/2011/06/10/is-free-global-trade-too-great-a-threat-to-food-supplies-natural-heritage-and-health/
	World Food Links Gazette	*Is free global trade too great a threat to our food supplies, natural heritage and health? 10 June 2011* http://gazette.worldfoodlinks.com/
	Food Safety news Today	*Is free global trade too great a threat to our food supplies, natural heritage and health? 10 June 2011* http://foodsafety.einnews.com/pr-news/444848-is-free-global-trade-too-great-a-threat-to-food-supplies-natural-heritage-and-health-food-safety-news-today-provides-complete-coverage
July		
	Food Security website	*The Politics of Food* blog by Gareth Edwards Jones http://www.foodsecurity.ac.uk/blog/index.php/2011/07/the-politics-of-food/#more-567 11 July 2011
	RuSource	Briefing 1321: *Field advisors and knowledge exchange* Relu P&P note

		30 13 July 2011
	BBC Radio Coventry	Wyn Grant interview on the badger cull 19 July 2011
	International Association for Landscape Ecology website	*Who should run the countryside*? November 16, 2011 Celebrating the Rural Economy and Land Use (Relu) Programme and looking ahead at the future of rural areas. The Sage, Gateshead, UK http://iale.org.uk/landscape-ecology-events
	NERC Newsletter	*Changing role of local government in managing water resources* July newsletter http://www.nerc.ac.uk/using/news/newsletters/2011/july.pdf
August		
	Society Now	*Who should run the countryside* – news item about Relu conference summer 2011 http://content.yudu.com/Library/A1tf34/SOCIETYNOWSUMMER2011/resources/index.htm?referrerUrl=
	RTPI bulletin	*Loweswater Care project* 19 August 2011 http://www.rtpi.org.uk/item/3891&ap=1
	RTPI bulletin	*Who should run the countryside*? Relu conference 19 August 2011 http://www.rtpi.org.uk/item/3883&ap=1
	Farming Monthly	*E coli in the countryside: whose problem is it anyway*? http://www.farmingmonthly.co.uk/the-news/2300-e-coli-in-the-countryside-whose-problem-is-it-anyway.html?catid=1%3Alatest-news Farming Monthly National,25 August 2011
	Brightsurf.com	*E coli in the countryside: whose problem is it anyway*? http://www.brightsurf.com/news/headlines/68313/E_coli_in_the_countryside_whose_problem_is_it_anyway.html 25 August 2011
	Politics.co.uk	*E coli in the countryside: whose problem is it anyway*? http://www.politics.co.uk/opinion-formers/economic-social-research-council-esrc/article/e-coli-in-the-countryside-whose-problem-is-it-anyway-ask-esr 25 August 2011
	EurekAlert	*E coli in the countryside: whose problem is it anyway?* http://www.eurekalert.org/pub_releases/2011-08/esr-eci082511.php 25 August 2011
	Tradingcharts.com	*E coli in the countryside: whose problem is it anyway*? http://news.tradingcharts.com/futures/7/8/163811987.html 25 August 2011
	Wired.gov	*E coli in the countryside: whose problem is it anyway?* http://www.wired-gov.net/wg/wg-news-1.nsf/0/D3A03FE284597F0A802578F7003DEA22?OpenDocument 25 August 2011
	Farming UK	*E coli in the countryside: whose problem is it anyway*? http://www.farminguk.com/news/E-coli-in-the-countryside-whose-problem-is-it-anyway_21415.html 25 August 2011
	FirstScience.com	*E coli in the countryside: whose problem is it anyway*? http://www.firstscience.com/home/news/breaking-news-all-topics/e-coli-in-the-countryside-whose-problem-is-it-anyway-page-2-1_112036.html 25 August 2011
	HealthMed news	*Lack of knowledge about the risk of the e.coli 0157 leads to a lack of social responsibility* http://health-med-news.com/health/lack-of-knowledge-about-the-risk-of-the-e-coli-0157-leads-to-a-lack-of-social-responsibility/ 26 August 2011
	Local Gov Chronicle	*Getting better ecological value from rural landscapes* – opinion piece by Philip Lowe on protected areas http://www.lgcplus.com/getting-

		better-ecological-value-from-rural-landscapes/5034162.article 30 August 2011
September		
	RuSource news bulletin	*Animal and Plant Disease Policy* 14 September 2011
	Farming on line	*Relu scientists call for agri-environment schemes in National Parks* 12 September 2011 http://www.farming.co.uk/articles/view/5055
	Farmers Guardian	*Calls made for new agri environment scheme 1*2 September 2011 www.farmersguardian.com/news/calls...for...scheme/41532.article
	Veterinary Record	*Securing the veterinary role in society* by A Liddon, S Bradley and P Lowe, p302-303 17 September 2011 http://veterinaryrecord.bmj.com/content/169/12/302.full and editorial p294 http://veterinaryrecord.bmj.com/content/169/12/294.full
	Treehugger.com	*Academics call on National Parks to take the lead in cooperative land management 16 September 2011* http://topics.treehugger.com/article/0bTr8Vp03j3ID?q=(environment+OR+environmental+OR+Green+OR+sustainable+OR+sustainability)+AND+(economy+OR+economic+OR+recession+OR+stimulus+OR+budget)
	Roadrunner.com	*Academics call on National Parks to take the lead in cooperative land management 16 September 2011* http://features.rr.com/article/0bTr8Vp03j3ID?q=Wales
	Newsfeedbook.com	*Academics call on National Parks to take the lead in cooperative land management 16 September 2011* http://www.newsfeedbook.com/link/alpha_galileo/academics_call_on_national_parks_to_take_the_lead_in_cooperative_land_management/1755707
	Farming Monthly	*Livestock sellers should provide more information about disease* risk 21 September 2011 http://www.farmingmonthly.co.uk/the-news/2365-livestock-sellers-should-provide-more-information-about-disease-risk-say-researchers.html?catid=59%3Aanimal-health-news
	Sustainablegov.com	*Livestock sellers should provide more information about disease risk* 21 September 2011 http://www.sustainablegov.co.uk/science-and-technology/life-sciences/livestock-sellers-should-provide-more-information-about-disease-risk-say-researchers
	BBSRC website	Livestock sellers should provide more information about disease risk 21 September 2011 http://www.bbsrc.ac.uk/news/food-security/2011/110921-pr-livestock-sellers-disease-risk.aspx
	Press and Journal	Call to reveal health status of stock at sales 22 September 2011
	The Beef Site	More Information from sellers to minimise disease risk 22 September 2011 http://www.thebeefsite.com/news/35935/more-info-from-sellers-to-minimise-disease-risk
	Farmers Weekly interactive	*Scientists call for transparency on disease* (press release on Medley project) 22 September 2011 http://www.fwi.co.uk/Articles/22/09/2011/129177/Scientists-call-for-transparency-on-disease.htm
	Physorg.com	*Livestock sellers should provide more information about disease risk* 22 September 2011 http://www.physorg.com/print235898525.html
	Farming.co.uk	*Cattle disease researchers call for more information from sellers* 22 September 2011

		http://www.farming.co.uk/articles/view/5159
	Veterinary Record	*Neoliberal reform and the veterinary profession* by G Enticott, P Lowe and K Wilkinson 169 24 September 2011 http://veterinaryrecord.bmj.com/content/169/13/327.full
	Newcastle Journal	*Cash incentive needed to control endemic diseases* 26 Septem ber 2011
	Webnewswire.com	*Livestock sellers should provide more information about disease risk 26* September 2011
	NEBusiness.co.uk	*Cash incentive needed to control endemic diseases* 26 Septem ber 2011
	BBC TV	*Countryfile* item on blue algae in Lake District included interview with stakeholder farmer about how Loweswater project has benefited him and environment http://www.bbc.co.uk/programmes/b006t0bv 25 September 2011
	Science Daily	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.sciencedaily.com/releases/2011/09/110927092124.htm
	eSciencenews	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://esciencenews.com/sources/science.daily/2011/09/27/rethinking.animal.and.plant.disease.21st.century.and.beyond
	Newsecology.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.newsecology.com/agriculture-and-food/agriculture-and-food/15659-rethinking-animal-and-plant-disease-for-the-21st-century-and-beyond.html
	Greatbluemarble.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.greatbluemarble.com/rethinking-animal-and-plant-disease-for-the-21st-century-and-beyond/
	Xericworld.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.xericworld.com/forums/plant-news-publications/2413-rethinking-animal-plant-disease-21st-century-beyond.html
	Regator.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://regator.com/p/253264445/rethinking_animal_and_plant_disease_for_the_21st/
	Seedquest.com	*Time to rethink our approach to animal and plant disease?* 27 September 2011http://www.seedquest.com/news.php?type=news&id_article=21034&id_region=&id_category=&id_crop=
	eBionews.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.ebionews.com/sitemap.html
	Livephysics.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.livephysics.com/latest-physics-news/science-daily-news.html
	Webpartner.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://webpartner.com/AgribizNews
	Newsecology.com	*http://www.newsecology.com/agriculture-and-food/agriculture-and-food/15659-rethinking-animal-and-plant-disease-for-the-21st-century-and-beyond.html* 27 September 2011
	Onenewspage.com	*Rethinking animal and plant disease policy for 21st century and beyond* 27 September 2011 http://www.onenewspage.com/n/Science/74mty2hhq/Rethinking-animal-and-plant-disease-for-the-21st.htm
	RuSource newsletter	*Animal Disease Governance* Relu P&P note 28 September 2011

	Farmers Weekly	*Buyers should be alerted to risks (*press release on Medley project*)* p14 30 September 2011
	Farmers' Guardian	*Understanding herd health is key to controlling livestock diseases* p26 30 September 2011 http://www.farmersguardian.com/home/livestock/livestock-news/understanding-herd-health-is-key-in-controlling-livestock-diseases/41798.article
	RuSource news briefing	Briefing 1385: Protected landscapes item on Relu P&P Note no 33. 26 October 2011
October		
	Veterinary Record	*Securing the veterinary role in society* by A Liddon, S Bradley and P Lowe 169, 302-303 http://veterinaryrecord.bmj.com/content/169/12/302.full.pdf
	Veterinary Record	*Neoliberal reform of the veterinary profession* by G Enticott, P Lowe and K Wilkinson 169, 327-329 http://veterinaryrecord.bmj.com/cgi/reprint/169/13/327
	Veterinary Record	*Who or what is a veterinary specialist*? by A Gardiner, P Lowe and J Armstrong 69 p354-356 http://veterinaryrecord.bmj.com/content/169/14/354.full 1 October 2011
	Veterinary Record	*Taking up the public health challenge* by K Clarke and C Jones 169 p 384-385 8 October 2011http://veterinaryrecord.bmj.com/content/169/15/384.full
	Veterinary Record	*Veterinary field expertise: using knowledge gained on the job* by A Proctor, P Lowe, J Phillipson and A Donaldson 169, 408-410. http://veterinaryrecord.bmj.com/content/169/16/408.full.pdf
	Veterinary Record	*The Lowe report and its echoes from history* by A Woods 169, 434-436 http://veterinaryrecord.bmj.com/content/169/17/434.full
	RTPI newsletter	*Academics call on national parks to take a lead in land management* 14 October 2011http://alphagalileo.de/Organisations/ViewItem.aspx?OrganisationId=88&ItemId=112669&CultureCode=en
	Global Food Security website	*The devils and the details of disease* blog from Wyn Grant 18 October 2011 *http://www.foodsecurity.ac.uk/blog/index.php/2011/10/the-devils-and-the-details-of-disease/*
	RuSource news bulletin	*Briefing 1385: Protected landscapes* 26 October 2011 Relu P&P note 33
November		
	International Association Landscape Ecology website	*Who should run the countryside?* Relu conference November 2011 http://iale.org.uk/landscape-ecology-events http://iale.org.uk/node/374
	Farming Monthly	*Can we expect farmers to bear all the responsibility for heath of livestock asks NFU vice president* 7 November 2011 http://www.farmingmonthly.co.uk/the-news/latest-news/67-show-news/2490-can-we-expect-farmers-to-bear-all-the-responsibility-for-the-health-of-livestock-asks-nfu-vice-president.html
	Farming Monthly	*Concerns about food supplies should trump environmental worries* 9 November 2011
	NE Business	*University event to put spotlight on owning land* 11 November 2011 *http://www.gazettelive.co.uk/src/webroot/nebusiness/farming-*

		news/farming-news/2011/11/11/university-event-to-put-spotlight-on-owning-land-51140-29755315/
	Newcastle Journal	*University event to put spotlight on owning land* 11 November 2011 http://www.nebusiness.co.uk/farming-news/farming-news/2011/11/11/university-event-to-put-spotlight-on-owning-land-51140-29755315/
	Silobreaker.com	*University event puts spotlight on owning land* 11 November 2011 *http://www.silobreaker.com/alan-woods-11_3069204*
	Gazette and Herald	*Conference to debate animal health* 12 November 2011
	RCVS News	*Making sense of the letters – consultation launched in simplifying specialisation* referencing Lowe report November 2011
	Newcastle Journal	*Major conference opens on Tyneside to mark success of project* 16 November 2011 http://www.journallive.co.uk/north-east-news/todays-news/2011/11/16/major-conference-opens-on-tyneside-to-mark-success-of-project-61634-29786029/
	Aberdeen University web news	*Uplands science makes an X factor impact at Gateshead* 17 November 2011http://www.abdn.ac.uk/news/details-10958.php
	Press and Journal	*Scientists scoop award for work* 26 November 2011
	Britain in 2012	*Science by non scientists* p 13, *Belief in biodiversity* p15, *Between lab and field* p 93
	International Association Landscape Ecology website	*Who should run the countryside?* Relu conference November 2011 http://iale.org.uk/landscape-ecology-events http://iale.org.uk/node/374
December		
	In Practice	*Ecologists as farm advisors; using knowledge and skills gained on the job* by Amy Proctor, Jeremy Phillipson, Philip Lowe and Andrew Donaldson No 74 p16-18 December 2011
	ESRC web news	*Water, Flooding and Public Trust* – article on Water White Paper mentioning Relu projects, including piece on S Whatmore project winning Relu award 8 December 2011 http://www.esrc.ac.uk/impacts-and-findings/features-casestudies/features/18914/water-flooding-and-public-trust.aspx
	Property Week	*Game on* 9 December Alister Scott's Rufopoly game *http://www.propertyweek.com/news/ludgate/game-on/5029039.article*
	The Guardian	*Is devolution plan a smokescreen for cuts* 11 December mentions Rufopoly http://www.guardian.co.uk/search?q=rufopoly&section=
	Observer	*On top of their games* Lucy Siegel ethical column on board games mentions "Rufopoly" game 11 December 2011 *http://www.guardian.co.uk/environment/2011/dec/11/lucy-siegle-childrens-board-games*
	Times Higher Education	*Fresh crop of winners and losers* 15 December 2011– Alister Scott's Rufopoly game http://www.timeshighereducation.co.uk/story.asp?sectioncode=26&storycode=418402&c
	LSE Politics and Policy blog	*The best policy-making often comes out of crises, when different disciplines must work together to find solutions.* 21 December 2011 blog by Katy Wilkinson drawing on Relu research http://blogs.lse.ac.uk/politicsandpolicy/2011/12/21/policy-making-crisis/#Author

	Birmingham Post	*How quickly government disregards its green values* article by Alister Scott 22 December 2011
	In Practice	*Ecologists as farm advisors; using knowledge and skills gained on the job* by Amy Proctor, Jeremy Phillipson, Philip Lowe and Andrew Donaldson No 74 p16-18 December 2011
	ESRC web news	*Water, Flooding and Public Trust* – article on Water White Paper mentioning Relu projects, including piece on S Whatmore project winning Relu award 8 December 2011 http://www.esrc.ac.uk/impacts-and-findings/features-casestudies/features/18914/water-flooding-and-public-trust.aspx
	Property Week	*Game on* 9 December Alister Scott's Rufopoly game *http://www.propertyweek.com/news/ludgate/game-on/5029039.article*
	The Guardian	*Is devolution plan a smokescreen for cuts* 11 December mentions Rufopoly http://www.guardian.co.uk/search?q=rufopoly&section=
	Observer	*On top of their games* Lucy Siegel ethical column on board games mentions "Rufopoly" game 11 December 2011 *http://www.guardian.co.uk/environment/2011/dec/11/lucy-siegle-childrens-board-games*
	Food Security blog	Has environmental protection taken the edge off UK farming's competitiveness? Mark Tinsley makes the case. 21 December 2011 http://www.foodsecurity.ac.uk/blog/index.php/tag/food-security/
	RICS Yorkshire and Humber blog	Is land ownership a privilege or a responsibility? By Geoff White, Head of Public Policy and Communications, RICS North 2 December 2011 http://www2.rics.org/AspNetForums/blogs/yorkshireandhumberaspx/archive/2011/12/02/is-land-ownership-a-privilege-or-a-responsibility.aspx

PRESENTATIONS TO STAKEHOLDERS FROM LIVE PROJECTS 2011

Austin, Z. (2011) 'Exploring uncertainty and technology in animal disease management' Presentation at end of project conference *Lost in Translation: Living with Uncertainty in animal disease management*, Royal College of Surgeons, London, 21 September 2011.

Franks, J. (2011) Relu Dissemination Event 2011. Telephone conference with IBDA working group. Eight members of Defra's Integrated Biodiversity Delivery Areas (IBDA) Working Group, led by David Appleton.

Franks, J. (2011) Relu Dissemination Event. Royal Society for the Protection of Birds, 27 October, Sandy, Bedfordshire. Collaborative Conservation: farmers' reactions and the design of cAESs.

Franks, J. (2011) Relu Dissemination Event: Defra, London, 18 November 2011, at Smith Square, London.

Franks, J. (2011) Relu Dissemination Event: Natural England Telephone (webinair) Conference. 9 November. Discussions with 6 employees of Natural England, including Steven Chaplin, Lesley Blainey (author of guidance paper for HR8 agreements)

Heathwaite, L. (2011) "Project introduction and overview" Presentation at end of project conference *Lost in Translation: Living with Uncertainty in animal disease management*, Royal College of Surgeons, London, 21 September.

Latham, S. (2011) 'Uncertainty in animal disease management: developing a conceptual model' Presentation at end of project conference *Lost in Translation: Living with Uncertainty in animal disease management*, Royal College of Surgeons, London, 21 September.

Lowe, P, (2011) *'UK Agriculture and Climate Change'.* Food Security - Challenges and Opportunities for Animal Science, University of Nottingham, organized by British Society of Animal Science, BBSRC Animal Science Forum, World Poultry Science Association (UK Branch) and the Association for Veterinary Teaching and Research Work.

Lowe, P. (2011) International conference *"Interdisciplinary progress in environmental science and management",* Newcastle. Presentation on "*Ordering knowledge: A response to G. W. Trompf's "The classification of the sciences and the quest for interdisciplinarity"* and lead discussant on "*Dilemmas in interdisciplinarity"*

Lowe, P. (2011) *'Why social sciences should engage with natural sciences'.* Cardiff University Lecture Series, Cardiff.

Lowe, P. (2011) *'Challenges in Policy Relevant Interdisciplinary Science'*, SPRU / Royal Society Workshop, Royal Society, London

Lowe, P. (2011) *'Lessons for KE from Relu'* LWEC meeting on Integrated Research and Decision-making for the Land: Scope for Development of a Joint Approach to Knowledge Exchange, Defra, London.

Lowe, P. (2011) *'Promoting links between researchers and government'* Engaging Academic Social Scientists in Government Policy Making and Delivery, British Academy, London.

Lowe, P. (2011) *'Relu and Interdisciplinarity'* Interdisciplinary Masterclass: Leadership training for Interdisciplinary Environmental Initiatives, University of Edinburgh.

Lowe, P. (2011) *'The Relu Programme: Fostering Interdisciplinarity and Knowledge Exchange"* ESRC Research Committee, RIBA, London.

Lowe, P. (2011) *'UK Agriculture and Climate Change: Socio-Legal Perspectives'* Reducing greenhouse gas emissions from agriculture: meeting the challenges of food security and climate change, Royal Society, London.

MacRitchie L.A. (August 2011) A population based exposure assessment on risk factors associated with Gastrointestinal pathogens: A Campylobacter study. CHRO, Vancouver

MacRitchie LA (2011) Public perception of Campylobacter risk and acceptability of intervention in the poultry industry. CHRO, Vancouver (poster presentation)

Millman CE (2011) Test your knowledge of food safety in the kitchen, an interactive workshop. RELU annual conference, Newcastle (poster presentation and interactive workshop)

Phillipson, J. (2011) *'Knowledge Exchange for Impact: Perspectives from the UK Research Councils' Rural Economy and Land Use Programme'* National Centre for Research Methods What is knowledge? What role does user engagement, co-production and impact play? British Academy, London.

Phillipson, J. (2011) *'Accounting for Knowledge Exchange and Impact'* G8 Heads of Research Assessment meeting, London.

Phillipson, J. (2011) '*Local fisheries governance and territorial development*', European Commission conference on Axis 4 of the European Fisheries Fund, Brussels.

Phillipson, J. (2011) *'The Relu Programme: Fostering Knowledge Exchange'* NERC/LWEC Knowledge Exchange Good Practice event, Royal Institution, London.

Phillipson, J. (2011) *'The Rural Economy and Land Use Programme: Adventures in Science'* .Rural Economy discussion and lunch, House of Lords, London.

Proctor, A, Phillipson, J, Lowe, P and Donaldson, A, *Rural Professions and field-based expertise,* Royal Geographical Society Annual International Conference, London, 1-9-11.
Proctor, A, *Rural Professions and field-based expertise,* Scottish Agricultural College, Edinburgh, 13-10-11
Quilliam RS (2011) Epiphytic and endophytic activity of *E. coli* O157:H7 varies in different cultivars of lettuce. PlantMicro-Wales conference, Bangor University (oral presentation).
Quilliam RS (2011) Epiphytic and endophytic activity of *E. coli* O157:H7 varies in different cultivars of lettuce. FEMS Microbiology Congress, Geneva (poster presentation).
Quilliam RS (2011) Epiphytic and endophytic activity of *E. coli* O157:H7 varies in different cultivars of lettuce. SfAM Summer conference, Dublin (poster presentation).
Strachan, N. et al. (2011) British Society of Animal Science, Nottingham. April 2011. 'Eliciting expert perceptions of the efficacy and practicality of pathogen control measures: *E. coli* O157 and human health'. Paper presentation.
Strachan, N. et al. (2011) North West Zoonoses Group Conference. *Zoonoses in a Changing Socioeconomic Environment* on July 6th 2011. 'Estimating the best way forward: Expert and farmer evaluations of environmental interventions to reduce human exposure to *E. coli* O157'.
Strachan, N. et al. (2011) Environmental Health Conference. Salvador, Brazil, February 2011. `Eliciting expert perceptions of the efficacy and practicality of pathogen control measures: *E. coli* O157 and human health'. Poster.
Williams AP (2011) From catchment to coast: influence of land use on the activity if waterborne *Escherichia coli* O157. SfAM Summer conference, Dublin (poster presentation).
Williams AP (2011) From catchment to coast: influence of land use on the activity if waterborne *Escherichia coli* O157. FEMS Microbiology Congress, Geneva (poster presentation).
Williams AP (2011) From catchment to coast: influence of land use on the activity if waterborne *Escherichia coli* O157. Teagasc Catchment Science conference, Dublin (poster presentation).

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

Jan 11	**Lesson learning:** ESRC Research Committee, RIBA, London. Presentation on *"The Relu Programme: Fostering Interdisciplinarity and Knowledge Exchange"*
	Invited address: Interdisciplinary Masterclass: Leadership training for Interdisciplinary Environmental Initiatives, University of Edinburgh. Presentation on *"Relu and Interdisciplinarity"*
Feb 11	*"Impact 360: Success Stories from the Sustainable Urban Environment",* Sustainable Urban Environments ISSUES conference**,** London
	Invited address: *Reducing greenhouse gas emissions from agriculture: meeting the challenges of food security and climate change*", Royal Society, London. Presentation on *"UK Agriculture and Climate Change: Socio-Legal Perspectives"*
	"Catchment Management & Public Engagement" Relu/Northern Rural Network Short Course, Newcastle University
	Relu/LWEC Sustainable Uplands *"Transforming Knowledge for Upland Change",* York
Mar 11	SPRU / Royal Society Workshop *"Challenges in Policy Relevant Interdisciplinary Science",* Royal Society, London
	Invited address: Royal College of Veterinary Surgeons working group on Vet Specialisation. Presentation on *'Veterinary Specialisation'*
Apr 11	**Invited Address:** *"Food Security - Challenges and Opportunities for Animal Science",* University of Nottingham, organized by British Society of Animal Science, BBSRC Animal Science Forum, World Poultry Science Association (UK Branch) and the Association for Veterinary Teaching and Research Work. Presentation on *"UK Agriculture and Climate Change".*
May 11	*New Horizons for Animal and Plant Disease from the Relu Programme* workshop**,** Regents College, London
	Invited Address: Cardiff University Lecture Series, Cardiff. Presentation on '*Why social sciences should engage with natural sciences*'.
Jun 11	**Invited Address:** *"Engaging Academic Social Scientists in Government Policy Making and Delivery",* British Academy, London. Presentation on *'Promoting links between researchers and government'*
	Global Food Security and Foresight Workshop, Mary Sumner House, London
	Invited Address: LWEC meeting on *"Integrated Research and Decision-making for the Land: Scope for Development of a Joint Approach to Knowledge Exchange"* Defra, London. Presentation on *"Lessons for KE from Relu"*
Jul 11	**Lesson Learning/Invited Address:** NERC/LWEC "*Knowledge Exchange Good Practice"* event, Royal Institution, London. Presentation on *"The Relu Programme: Fostering Knowledge Exchange"*
	Invited Address: International conference *"Interdisciplinary progress in environmental science and management",* Newcastle. Presentation on "*Ordering knowledge: A response to G. W. Trompf's "The classification of the sciences and the quest for interdisciplinarity"* and lead discussant on "*Dilemmas in interdisciplinarity"*
Aug 11	*"Conservation Conflicts"* interdisciplinary conference, Relu Sponsored Event at Aberdeen Centre for Environmental Sustainability, Aberdeen Arts Centre
Sep 11	Uplands Policy Review and the Role of National Parks, Northern Rural Network seminar, Newcastle University. Launch of Relu Policy and Practice Note 33 "*Could protected landscapes have a leading role to play in the sustainable management of natural resources?"*
	"Stakeholder views on involvement in academic led research" Relu sponsored workshop, Durham University
Oct 11	**Invited address:** National Centre for Research Methods "*What is knowledge? What role does user engagement, co-production and impact play?"* , British Academy, London. Presentation on *"Knowledge Exchange for Impact: Perspectives from the UK Research Councils' Rural Economy and Land Use Programme"*

Nov 11	**Invited address:** Rural Economy discussion and lunch, House of Lords, London. Presentation on *"The Rural Economy and Land Use Programme: Adventures in Science".*
	Invited address: European Commission conference on Axis 4 of the European Fisheries Fund. Presentation on "*Local fisheries governance and territorial development*", Brussels.
	Invited address: G8 Heads of Research Assessment meeting, London. Presentation on *"Accounting for Knowledge Exchange and Impact"*
	"Who should run the countryside", Relu Conference, SAGEGateshead
Dec 11	*Going with the flow:* Participatory approaches to river catchment management, Durham. Workshop run by "Building Adaptive Strategies for Environmental Change with Land Use Managers" project
	Invited session at LWEC *Knowledge exchange Good Practice Event,* London, on Relu's Stakeholder Impact Analysis Matrix

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	No additional co-funding in 2011
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)	No additional co-funding in 2011
Number of users placed with research programme	12 visiting fellows
Number of researchers placed in user organisations	2 work shadowers