



RURAL SCOTLAND IN FOCUS

2010



# contents

|   |    |
|---|----|
| Foreword  | 2  |
| Acknowledgements  | 3  |
| Report authors  | 4  |
| Executive Summary   | 5  |
| Introduction  | 7  |
| Local Authorities Map   | 8  |
| Report sections:  |    |
| 1. How is Scotland's rural population changing?                                   | 9  |
| 2. How resilient is the rural economy to the current economic crisis?             | 18 |
| 3. What is the future for Scotland's rural infrastructure and access to services? | 30 |
| 4. How are Scotland's rural communities taking ownership of their own future?     | 42 |
| 5. What impact will climate change have on rural Scotland?                        | 52 |
| 6. How effectively is water quality being managed?                                | 60 |
| 7. How well is farmland biodiversity being maintained?                            | 70 |
| 8. What future for upland biodiversity?   | 80 |
| 9. Concluding Comments and Questions for Debate                                   | 88 |





# Foreword



Rural Scotland covers more than 90% of Scotland's land mass and is home to approximately 20% of the population, that is, one million people. Rural Scotland is diverse, from remote and peripheral areas in Dumfries and Galloway, the Scottish Borders, the Highlands, Inner and Outer Isles and Northern Isles of Orkney and Shetland, through to more accessible rural areas in the Central Belt, Ayrshire and Lanarkshire, and around cities in the North East and Inverness. Within such areas, there is diversity too, in terms of population and economic structures, infrastructure and services, water quality, biodiversity, and potential for adaptations to climate change. It is this diversity which creates opportunities as well as challenges, as rural areas continue to change and adapt. It is these elements, and associated policies, which comprise the focus of this Report.

Our ambition for the Rural Scotland in Focus Report is that it will provide stimulus to ongoing debates, and inform dialogue on policy and practice options for the benefit of rural Scotland.

The Report's commentary has been written by policy researchers from SAC's Rural Policy Centre, along with contributions from specialist authors from partner organisations across Scotland. The process of producing the Report was steered by a Project Advisory Group from a variety of institutions. This partnership approach was important for producing a Report which encompasses a range of perspectives, and aims to reflect the very ethos of working together to identify and address sustainability challenges and opportunities in rural Scotland.

In focusing on rural Scotland, we have not sought to separate rural from the rest of the country. Rather, we have identified and discussed many of the specific attributes and characteristics of Scotland's rural areas, and the implications these may have for practice and policy. It is our aim that, through this Report and subsequent "In Focus" outputs, we will add further evidence for debate and thus support the identification of appropriate ways forward for a thriving and vibrant rural economy, society and environment that continues to be a vital part of Scotland as a whole.

## Facal-toisich

Tha Alba dhùthchail a' sìneadh thar còrr is 90% de thìr na h-Alba, agus tha mu 20% den t-sluagh a' fuireach innte, aon mhillean duine. 'S ann eugsamhlach a tha sgìrean dùthchail na h-Alba, bho àiteachan iomallach air an oir ann an Dùn Phris is Gall-Ghàidhealaibh, Crichean na h-Alba, a' Ghàidhealtachd, Na h-Eileanan A-muigh is A-staigh, agus Eileanan Arcaibh is Sealtainn aig Tuath, chun nan àiteachan dùthchail a tha nas so-ruigsinn ann am meadhan na h-Alba, Siorrachd Àir is Siorrachd Lannraig, agus timcheall air na bailtean-mòra san Ear-thuath agus timcheall Inbhir Nis. Taobh a-staigh nan sgìrean seo fhèin, tha eugsamhlachd cuideachd, a thaobh àireamh an t-sluaigh agus structairean eaconamach, bun-structair agus sheirbheisean, càileachd uisge, bith-iomadachd, agus mar a dh'fhaodadh gum feumar dèiligeadh ri buaidh atharraichean sa ghnàth-shìde. 'S i an eugsamhlachd seo a tha a' cruthachadh chothroman cho math ri dùbhlain, agus sgìrean dùthchail an dà chuid a' sìor atharrachadh agus a' lorg fhreagairtean. 'S iad na cuspairean seo, agus na poileasaidhean co-cheangailte riutha, a tha fon phrosbaig san Aithisg seo.

Le Aithisg air Alba Dhùthchail fon Phrosbaig tha sinn ag iarraidh na deasbadaan a tha gan cumail an-dràsta a phiobrachadh, agus cur ri còmhraidhean mu phoileasaidhean agus roghainnean cur-an-gnìomh chum maith Alba dhùthchail.

Chaidh aithrisean na h-Aithisge a sgrìobhadh le luchd-rannsachaidh phoileasaidhean bho Ionad Phoileasaidhean Dùthchail Colaiste Àiteachas na h-Alba, agus cuideachd san aithisg tha sgrìobhaidhean le eòlaichean bho ar buidhnean com-pàirt bho air feadh na h-Alba. Chaidh an Aithisg a sgrìobhadh fo stiùir Buidheann Comhairleachaidh Pròiseict le buill bho chaochladh institiudan. B' ann cudromach a bha an co-obrachadh seo gus a bhith a' cur Aithisg ri chèile a nochdas diofar sheallaidhean, agus a tha ag amas air sealltainn mar a nì co-obrachadh feum le bhith comharrachadh agus a' cur aghaidh ri dùbhlain is cothroman a thig an lùib leantainneachd ann an Alba dhùthchail.

Ann a bhith a' cur Alba Dhùthchail fon phrosbaig, cha robh sinn ag iarraidh sgaradh a dhèanamh eadar sgìrean dùthchail agus an còrr den dùthaich. 'S e a rinn sinn, chomharraich agus bhruidhinn sinn mu dheidhinn tòrr de na feartan sònraichte a th' aig sgìrean dùthchail na h-Alba, agus a' bhuidhean a dh'fhaodadh a bhith aca sin air cur-an-gnìomh agus poileasaidhean. Tha e na amas dhuinn, leis an Aithisg seo agus toraidhean eile a thig bho "Fon Phrosbaig", gun cuir sinn susbaint ris an deasbad agus ri linn sin gun cuidich sinn le bhith a' lorg shlighean iomchaidh air adhart do eaconamaidh, sòisealtas agus àrainneachd dhùthchail, bhrioghmhor a tha a' soirbheachadh agus a leanas air a bhith nam pàirt deatamach de Alba gu lèir.

Professor Bill McKelvey  
Proifeasair Bill McKelvey

Chief Executive and Principal  
Àrd-oifigear agus Prionnsapal

# Acknowledgements

## Project Advisory Group

We are indebted to the Project Advisory Group for reading through earlier drafts of the whole report and of subsequent sections as they went through their various stages of development. The members of the PAG were: David Green (Cairngorms National Park Chairman and SAC Board Member), Dick Birnie (MLURI), Angela Hallam (Scottish Government), Kathy Johnston (Scottish Government), Norman MacAskill (SCVO), Ed Mackey (SNH), Ewan Mearns (Scottish Enterprise) and Julian Pace (Scottish Enterprise). We were also advised on an earlier draft by a range of contacts proposed by the PAG, and we have been extremely grateful for the guidance received. However, all errors and omissions remain the responsibility of the Report authors.

## Specialist contributors

We also wish to thank those individuals who wrote specific components as "In Focus" boxes for the different Sections; they are recognised specialists in their fields, and thus bring added depth and understanding to the Report:

**Professor Jane Farmer** is Chair of Rural Health Policy and Management and Co-director at the UHI Millennium Institute and University of Aberdeen Centre for Rural Health, based in Inverness. The UHI part of CRH studies ways of providing health and social care services to remote and rural areas and is particularly focused on how communities can be involved in planning services and ways community members are becoming involved in supporting service provision in remote and rural areas internationally.

**Professor John Farrington** has worked widely in rural geography, accessibility, sustainability and policy relations. He views research as informing policy while being informed by theory. He has particular experience of large-scale projects on rural accessibility and social justice, sustainable rural land use in the EU, and rural animal-based disease. He is currently Director of the RCUK Rural Digital Economy Research Hub at the University of Aberdeen, and is also working in an ESRC e-Social Science project to develop a virtual research environment for interdisciplinary research.

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**Hugh McLean**, now a retired senior manager within the speciality chemical industry, as the original chairman of Atlantis Leisure led the team of volunteer directors through the main development phase and was responsible for its successful succession planning process. Now looks to assist other community organisations to benefit from his experience.

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## Report photographs

The majority of photographs in the Rural Scotland in Focus Report were specially commissioned by SAC from Iain White, Scotland on Canvas. Thanks go to Eric Bignal (European Forum on Nature Conservation & Pastoralism), J N Cape, Paul Chapman (SAC) for additional images used.

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# Report authors

The Report Sections were written by researchers who work within SAC's Rural Policy Centre.

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In addition Professor Martin Price co-authored section 8 on the future of upland biodiversity.

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# Executive Summary

1. Our ambition for the **Rural Scotland in Focus Report** is that it will provide a stimulus to ongoing debates on the future of rural Scotland, and inform the dialogue on policy and practice options. It provides a commentary on specific issues, challenges, opportunities and policy-based interventions across the economic, environmental and social landscape of Scotland's rural areas.
2. **Scotland's rural population** is ageing fast, particularly in certain areas; this presents challenges in service delivery and opportunities for Scotland's communities. Scotland has a history of migration, and needs migrants to sustain current population levels. There are tensions between different targets, such as population increase, planning, housing, service and infrastructure improvements and climate change, mitigation and adaptation.
3. The **economic well-being of rural areas** appears to be slightly less affected by the current economic crisis than urban areas. The rural economy is, however, likely to be vulnerable to other factors, such as the funding and employment constraints in the public sector and possible future reductions in support to agriculture.
4. **Accessible infrastructure and services** are essential to modern life in rural Scotland. Initiatives over many years have targeted specific areas and communities; thus harnessing the lessons learnt continues to be essential. There is a need for strategic, innovative approaches that also build in user's priorities and experiences.
5. Many **rural communities are shaping their own future** through policies and mechanisms that encourage participation and capacity-building, at local, regional and national levels. There is a need to gather evidence of impacts and on the readiness of institutions to engage with communities.
6. Scotland is expected to experience a **changing climate** over the next century, with some impacts already occurring. Rural Scotland is in a good position to respond to challenges. There may be tensions between economic growth, food security, and climate change policy, requiring coherent activity across and between sectors.
7. **Water quality in rural Scotland** is generally good. However, the persistent challenge of diffuse pollution requires co-operative farmer action, support for the awareness-raising and mitigation activities planned by SEPA's Diffuse Pollution Mitigation Advisory Group, and changes to the structure of the CAP to help encourage farmer engagement with those activities.
8. **Farmland biodiversity** has improved within designated sites and for particular species, offset by a continuing decline in much of Scotland's wider countryside. Landscape simplification is the key driver, likely to continue without further major changes to the way that Common Agricultural Policy (CAP) support is targeted, including increasing cross-compliance conditions and increasing the funds available for agri-environment payments.
9. The composition of **upland biodiversity** is changing, key drivers being land management and climate change. Payment for public goods, or ecosystem services, is a key option for upland biodiversity maintenance. There is often a lack of necessary data to support decision-making, to target policy effectively and to monitor impact. Improvements in data availability and management are therefore necessary.
10. The report reaches the **conclusion** that change is already happening in rural Scotland and that the use of existing evidence about such changes and their drivers needs to improve. There must be greater dialogue on the tensions between the range of priorities across the economy, infrastructure, communities, climate change and biodiversity, such that we move more towards a focus on territories and regions rather than sectors. While Scotland is not isolated from global affairs, actions are required by government, other public, private and voluntary sectors, and by those living within and impacting upon rural Scotland. To support this, we propose actions and Key Debating Questions.

# Geàrr-chunntas Gnìomhach

1. Le **Aithisg air Alba Dhùthchail fon Phrosbaig** tha sinn ag iarraidh na deasbadan mu na tha an dàn do dh'Alba dhùthchail a phiobrachadh, agus cur ri còmhraidhean mu roghainnean poileasaidh agus cur-an-gnìomh. Tha i a' toirt cunntas air cùisean sònraichte, dùbhlain, cothroman agus poileasaidhean a tha a' toirt buaidh air eaconamaidh, àrainneachd agus sòisealtas sgìrean dhùthchail na h-Alba.
2. Tha **sluagh dhùthchail na h-Alba** a' sior fhàs nas aosta, gu sònraichte ann an cuid a sgìrean; tha seo na dhùbhlain do bhith libhrigeadh sheirbheisean agus a' cruthachadh chothroman do choimhearsnachdan na h-Alba. Tha pailteas fianais air imrich ann an eachdraidh na h-Alba, agus tha feum aig Alba air in-imrich gus an seas an àireamh-sluaigh aice. Tha cuid a thargaidean a' dol an aghaidh a chèile, mar meudachadh sluaigh, planadh, taigheadas, leasachadh sheirbheisean is a' bhun-structair, atharraichean sa ghnàth-shìde, a' lasachadh buaidh agus a' fàs suas ri suidheachadh.
3. Tha coltas ann nach eil an crìonadh eaconamach a th' ann an-dràsta a' toirt an uiread de bhuidh air **seasamh eaconamach nan sgìrean dhùthchail** agus a tha e air bailtean. Ge-tà, tha teansa mhath ann gun toir nithean eile buaidh air an eaconamaidh dhùthchail, mar bacaidhean air maoinachadh is obraichean san roinn phoblach agus isleachadh a dh'fhaodadh tighinn anns an taic do dh'àiteachas.
4. Tha **bun-structair agus seirbheisean so-ruigsinn** riatanach san latha an-diugh ann an Alba dhùthchail. Tha iomairtean thar iomadh bliadhna air a bhith ag amas air sgìrean is coimhearsnachdan fa leth; mar sin 's ann deatamach a tha e gun cuirear na dh'ionnsaicheadh gu feum. Tha feum air dòighean-obrach ùra, ro-innleachdach a ghabhas ealla ri eòlas agus prìomhachasan an luchd-cleachdaidh.
5. Tha tòrr **choimhearsnachdan dhùthchail a' dealbh an slighe fhèin** tro phoileasaidhean is shiùil a tha a' brosnachadh dhaoine a bhith gabhail pàirt ann an cùisean agus a tha ag amas air comas nan coimhearsnachdan a mheudachadh aig ìrean ionadail, roinneil agus nàiseanta. Feumar fianais a chruinneachadh air a' bhuidh a th' aca sin agus air dè cho deiseil agus a tha institiudan conaltradh ri coimhearsnachdan.
6. Thathar an dùil gun **atharraich gnàth-shìde** na h-Alba thar an ath cheud bliadhna, agus cuid de na h-atharraichean rim faicinn mu thràth. Tha Alba dhùthchail ann an suidheachadh math gus dèiligeadh ri seo. 'S dòcha gum bi strì ann eadar fàs eaconamach, tèarainteachd bidh, agus poileasaidhean airson atharraichean sa ghnàth-shìde, mar sin feumar obair aonaichte thar is eadar raointean-obrach.
7. Mar as trice tha **càileachd an uisge an Alba math**. Ge-tà, gus dèiligeadh ri truailleadh sgaoilte, feumar co-obrachadh bho thuathanaich, taic gus am bi daoine ag ionnsachadh mu dheidhinn, agus taic do obair lasachaidh a tha Buidheann Comhairleachaidh SEPA airson Lasachadh Truailleadh Sgaoilte an dùil a dhèanamh, agus feumar structair CAP atharrachadh gus tuathanaich a phiobrachadh gus a dhol an sàs sna nithean sin.
8. Thàinig piseach air **bith-iomadachd fearann àiteachais** taobh a-staigh raointean comharraichte agus a thaobh cuid a sheòrsaichean fiadh-bheatha, ach bha seo aig an aon àm agus a bha crìonadh leantainneach ann an tòrr de thìr dhùthchail na h-Alba. 'S e a bhith dèanamh cruth na tìre co-ionann bu mhotha bu choireach, agus a h-uile coltas gun lean seo mura h-atharraichear cò air a tha taic Phoileasaidh Coitcheann an Àiteachais ag amas, mar eisimpleir, barrachd chùmhnanntan tar-choileanaidh agus àrdachadh sa mhaoin a tha ri fhaotainn airson taic do dh'àiteachas le ceangal ris an àrainneachd.
9. Tha **bith-iomadachd nam monaidhean** ag atharrachadh, am measg nam prìomh adhbharan tha riaghladh fearainn agus atharraichean sa ghnàth-shìde. Am measg nam prìomh dhòighean bith-iomadachd nam monaidhean a dhìon tha pàigheadh airson bathar poblach, no seirbheisean eag-shiostaim. Gu tric tha fiosrachadh a dhith a dh'fheumar gus tighinn gu co-dhùnadh, gus poileasaidhean èifeachdach a chur an gnìomh agus gus sùil a chumail air buaidh na h-obrach. Mar sin, feumaidh piseach tighinn air an uiread fiosrachaidh a tha ri fhaotainn agus mar a thathar ga làimhseachadh.
10. Tha an aithisg a' tighinn chun a' **cho-dhùnaidh** gu bheil cùisean ag atharrachadh mu thràth ann an Alba dhùthchail agus gum feumar barrachd feum a dhèanamh den fhianais a th' againn mu na h-atharraichean sin agus na tha air cùl nan atharraichean sin. Feumar barrachd còmhraidh a bhith ann air an strì a th' ann eadar diofar phrìomhachasan airson an eaconamaidh, bun-structair, coimhearsnachdan, atharraichean sa ghnàth-shìde, agus bith-iomadachd, air chor 's gun gluais sinn gu bhith coimhead gu sònraichte air sgìrean agus roinnean-tìre seach raointean-obrach. Ged a tha Alba a' tighinn fo bhuidh chùisean an t-saoghail mhòir, feumaidh an riaghaltas, roinnean poblach eile, roinnean prìobhaideach is saor-thoileach, agus na daoine a tha a' fuireach ann agus a' toirt buaidh air Alba dhùthchail, a dhol an sàs sa chùis. Gus an tachair seo, tha sinn a' moladh ghnìomhan agus Prìomh Cheistean Deasbaid.



# Introduction

**The purpose of the report:** Our ambition for the Rural Scotland in Focus Report is that it will provide a stimulus to ongoing debates on the future of rural Scotland, and inform the dialogue on policy and practice options. The report provides a commentary on the challenges and opportunities that are significant for rural Scotland today and into the future.

It also brings together a range of usually unrelated themes into one report in an attempt to shift the debate from sectors to territories. The report seeks to highlight that while rural Scotland faces a range of challenges, it also has much to offer.

**Defining rural:** Two definitions of “rural” have been used. The Randall Definition (local authority districts which have a population density of less than 100 persons per square kilometre) and the Scottish Government’s Urban-Rural Classification. According to both definitions, rural Scotland covers more than 90% of Scotland’s land mass and is home to approximately 20% of the population, that is approximately one million people. Our report shows how rural Scotland is not separate from the rest of Scotland, but rather is an integral part of its economy, society and environment.

**Our focus:** The report examines the economic, environmental and social landscape of Scotland’s rural areas, by focusing on specific issues: the resilience of the rural economy, population change, infrastructure and services; climate change, biodiversity and water quality; and individual and community engagement. We concentrate on the changes that have already shaped a very diverse rural Scotland and comment on policy-based interventions that aim to address the challenges and realise the potential of our rural areas.

**Rural Scotland in Focus as a process:** It is envisaged that Rural Scotland In Focus will be a biennial publication accompanied by periodic interim ‘In Focus’ Briefings on specific themes. Over time the report should be able to track changes taking place in rural Scotland and therefore continue to provide evidence and comment to inform and challenge those who are working to build and sustain a vibrant rural Scotland. Each report will also be able to focus on key issues that are particularly pertinent at the time of publication and given that Rural Scotland in Focus is being launched in 2010 – International Year of Biodiversity – an important focus of this first report is biodiversity on farmland and in the uplands.

**The authors:** The Report has been written by researchers from SAC’s Rural Policy Centre, along with contributions from specialist authors from partner organisations, in transport, health, environment, the voluntary sector and rural services. It brings together, for the first time, evidence and commentary on a range of issues, and the cited source material allows the reader to explore these further. The work complements existing reports, such as the Royal Society of Edinburgh Inquiry (2009) into the future of Scotland’s hill and island areas, the OECD (2008) assessment of Scotland’s rural policy and the Carnegie UK Trust (2009) Charter for Rural Communities.

## Ro-ràdh

**Adhbhar na h-aithisge:** Le *Aithisg air Alba Dhùthchail fon Phrosbaig* tha sinn ag iarraidh na deasbadaid mu na tha an dàn do dh’Alba dhùthchail a phiobrachadh, agus cur ri còmhraidhean mu roghainnean poileasaidh agus cur-an-gnìomh. Tha an aithisg a’ toirt cunntas air na ceistean is cothroman cudromach a tha mu choinneimh Alba dhùthchail an-diugh agus a bhios mu choinneimh san ùine ri thighinn. Tha i cuideachd a’ toirt còmhla taghadh de chuspairean ann an aon aithisg nach bi mar as trice a’ tighinn fon aon cheann, feuch an gluais an deasbad bho raointean-obrach gu sgìrean. Tha an aithisg ag iarraidh dèanamh soilleir, ged a tha grunn dhùbhlain ro Alba dhùthchail, cha ghan na buadhan aice.

**Mineachadh air dùthchail:** Chaidh dà mhineachadh air “dùthchail” a chleachdadh. Chleachdadh Mineachadh Randall (ùghdarrasan ionadail le dùmhlachd sluaigh nas lugha na 100 duine gach cilemeatair ceàrnagach) agus Seòrsachadh Baile-Dùthchail Riaghaltas na h-Alba. A rèir an dà mhineachaid seo, tha Alba dhùthchail a’ sìneadh thar còrr is 90% de thìr na h-Alba, agus tha mu 20% den t-sluagh a’ fuireach innte, aon mhillean duine. Tha an aithisg againne a’ sealltainn nach eil Alba dhùthchail air a sgaradh bhon chòrr de Alba, ach gu bheil i na pàirt deatamach de a h-eaconamaidh, sòisealtas agus àrainneachd.

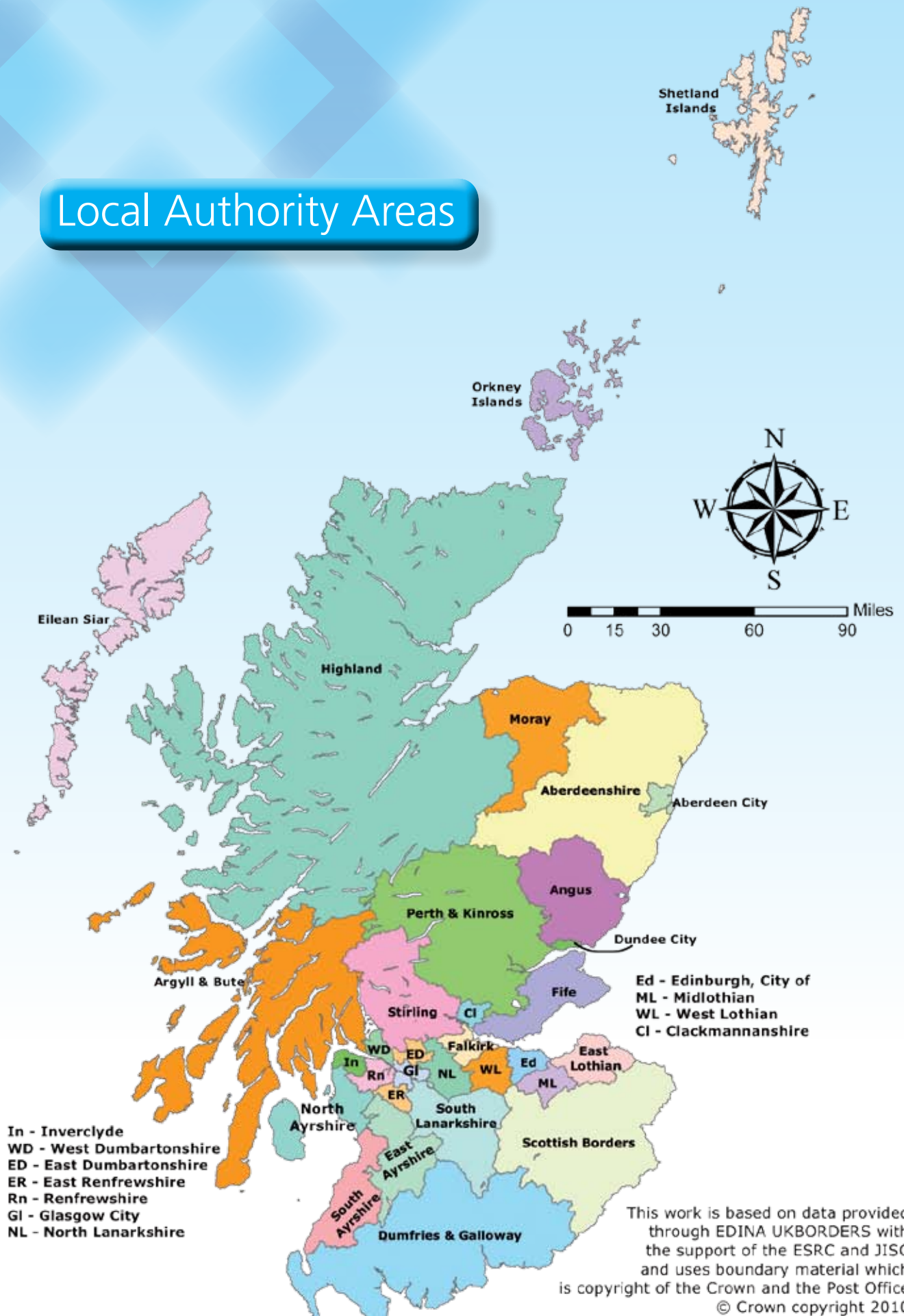
**An sealladh againne:** Tha an aithisg a’ toirt sùil air eaconamaidh, àrainneachd agus sòisealtas sgìrean dùthchail na h-Alba, le bhith a’ toirt sùil gheur air cùisean sònraichte: seasmhachd an eaconamaidh dhùthchail, atharraichean san t-sluagh, bun-structair is seirbheisean; atharraichean sa ghnàth-shìde, bith-iomadachd agus càileachd uisge; agus conaltradh ri daoine fa leth agus coimhearsnachdan. Tha sinn gu sònraichte a’ coimhead air atharraichean a thug buaidh mu thràth air Alba dhùthchail anns a bheil eugsamhlachd nach beag, agus bheir sinn beachd air poileasaidhean dha bheil e na amas dèiligeadh ris na dùbhlain a tha ro ar sgìrean dùthchail agus dha bheil e na amas gun soirbhich iad cho math ‘s as urrainn dhaibh.

**Alba Dhùthchail fon Phrosbaig mar phròiseas:** Thathar an dùil gum foillsichear Alba Dhùthchail fon Phrosbaig gach dàrna bliadhna, le Aithrisean ‘Fon Phrosbaig’ air cuspairean sònraichte a’ nochdadh san eadar-àm an-dràsta ‘s a-rithist. Thar ùine bu chòir gum b’ urrainn an aithisg sealltainn na h-atharraichean a tha a’ gabhail àite air an dùthaich an Alba, agus mar sin bidh fianais is beachdan ann a bheir fiosrachadh is dùbhlain dhaibhsan a tha a’ stri airson Alba dhùthchail a bhios brioghmhor agus seasmhach. Faoaidh gach aithisg cuideachd cùisean a chur fon phrosbaig a tha gu sònraichte cudromach aig an àm a thèid an aithisg fhoillseachadh, agus seach gu bheil a’ foillseachadh a’ chiad Alba Dhùthchail fon Phrosbaig ann an 2010 – Bliadhna Eadar-nàiseanta airson Bith-iomadachd – am measg nan cuspairean cudromach sa chiad aithisg seo bidh bith-iomadachd air talamh àiteachais agus air monaidhean.

**Na h-ùghdaran:** Chaidh an Aithisg a sgrìobhadh le luchd-rannsachaidh bho Ionad Phoileasaidhean Dùthchail Colaiste Àiteachas na h-Alba, agus cuideachd san aithisg tha sgrìobhaidhean le eòlaichean bho ar buidhnean com-pàirt ann an diofar raointean: còmhaidh, slàinte, an àrainneachd, an roinn shaor-thoileach agus seirbheisean dùthchail. Tha i a’ toirt còmhla, airson a’ chiad uair, fianais agus breithneachadh air caochladh chuspairean, agus tha na tùsan ainmichte a’ toirt cothrom don neach-leughaidh barrachd rannsachaidh a dhèanamh air na cuspairean sin. Tha an obair seo a’ cur ri aithisgean a th’ ann mu thràth, mar Sgrùdadh Comann Rìoghail Dhùn Èideann (2009) air na tha an dàn do roinnean ann an Alba anns a bheil talamh àrd agus eileanan, measadh OECD (2008) air poileasaidhean dùthchail na h-Alba agus Cairt Urras Carnegie RA (2009) airson Coimhearsnachdan Dùthchail.



# Local Authority Areas



# 1. How is Scotland's rural population changing?

Steven Thomson

## Key points:

1. There are significant regional and local level variations in Scotland's population:
  - a. Compared to urban and accessible rural Scotland, Scotland's remote rural population is older, with higher levels of retiree in-migration and youth out-migration;
  - b. Scotland's accessible rural areas, notably those in the east, have experienced rapid population growth in recent years in particular, attracting young families.
  - c. So, there are very different forces, pressures and needs in accessible and remote rural areas, with different policy implications.
2. Scotland's population is already ageing fast:
  - a. Some local areas in Scotland already have significant elderly populations;
  - b. By 2033 the population aged 75 years old and over is expected to have increased by 84%; the working age population is expected to have fallen by around 6.5%.
  - c. Policies for an ageing population need to be strengthened.
3. Scotland has a history of in-migration and needs migrants to sustain current population levels; this needs to be encouraged and facilitated.
4. There are tensions between different targets, such as increasing the population, providing affordable housing, and infrastructure improvements, alongside environmental priorities, climate change, mitigation and adaptation.

## 1.1. Introduction

Scotland's rural population is changing through immigration, emigration and natural population change. This is not a new phenomenon, but in today's global economy, migration has become increasingly easy and affordable, and, as a result, Scotland's rural areas are witnessing important changes.

There are significant variances in demographic trends across rural Scotland which are not often acknowledged when looking at headline statistics. In particular, there is a contrast between the population structure in Scotland's accessible commuting zones, and the more remote, peripheral areas.



One of the key issues is that our population is ageing, and ageing rapidly. In some rural areas this dynamic has already occurred and there are large proportions of elderly people through a combination of in-migration of retirees and the out-migration of younger generations.

One of many factors behind these longer term trends is Scotland's declining and ageing farming and crofting households which, alongside their workers, underpinned local communities for many years.

These demographic changes give rise to important policy questions in which there is considerable public and private interest, and the Scottish Government now has amongst its seven purpose targets<sup>1</sup> the aim "to match average European (EU15) population growth over the period from 2007 to 2017". More targeted emphasis will need to be placed on servicing the needs of an ageing rural population, particularly in health care provision, but also in the different lifestyle needs and choices that the older generations have. Equally the ageing population will impact on the workforce and may lead to increased employer costs, reduced workforce mobility and turnover and perhaps ill health issues. However, there is also evidence (see Section 4) that an ageing rural population contributes positively to local activities and services in rural areas, for example, through voluntary activity.

## 1.2. What is the Demography of Scotland's Rural Population?

### 1.2.1 Population Trends

Scotland's rural areas have a long history of demographic change including significant impacts such as the Highland Clearances, the rural exodus during and after the industrial revolution, loss of young men to both World Wars, and the counter-urbanisation phenomenon that started during the 1960s and 1970s in many of Scotland's more accessible rural areas with the advent of rural tourism. Scotland's population in 2002 was of a similar size to that of 1951<sup>2</sup> and is not expected to change significantly before 2030<sup>3</sup>. Following a period of decline from the mid-1970s, Scotland's population has been growing since 2002 with the highest population figure since 1981 (5,168,500) being recorded in 2008<sup>4</sup>. Figure 1 illustrates that Scotland's rural areas are now witnessing faster population growth than the towns and cities, with accessible rural areas<sup>5</sup> experiencing an 11.5% increase, and remote rural areas<sup>6</sup> a 5% growth in population since 2000.

<sup>1</sup> <http://www.scotland.gov.uk/About/scotPerforms/purposes>

<sup>2</sup> ESRC (2004) *The Demographic Trends in Scotland: A Shrinking and Ageing Population*

<sup>3</sup> Scotland's Future Forum (2007) *Scotland with an ageing population: economic and demographic changes we should have met by 2031*

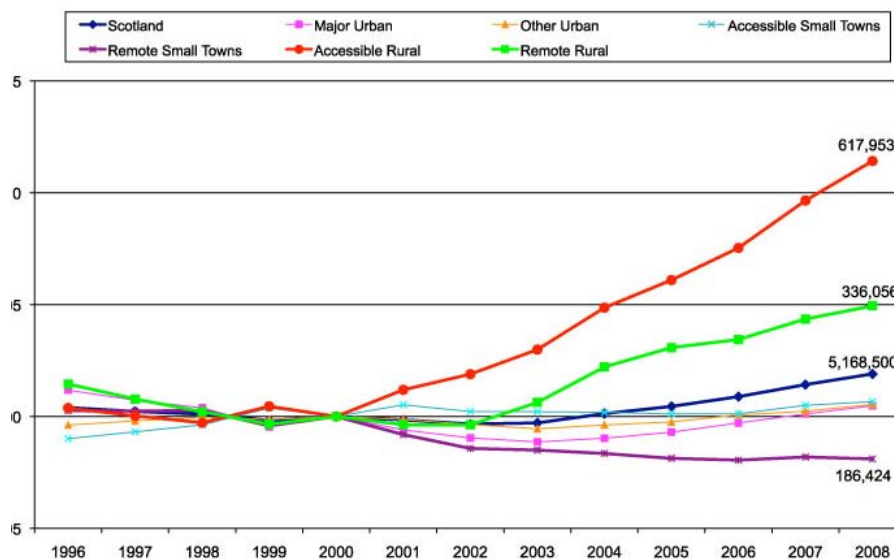
<sup>4</sup> GROS (2009) *Mid-2008 Population Estimates: Population Estimates by sex, age and administrative area*

<sup>5</sup> Population less than 3,000 within 30 minutes drive of a urban area (population greater than 10,000)

<sup>6</sup> Population less than 3,000 over 30 minutes drive of a urban area (population greater than 10,000)



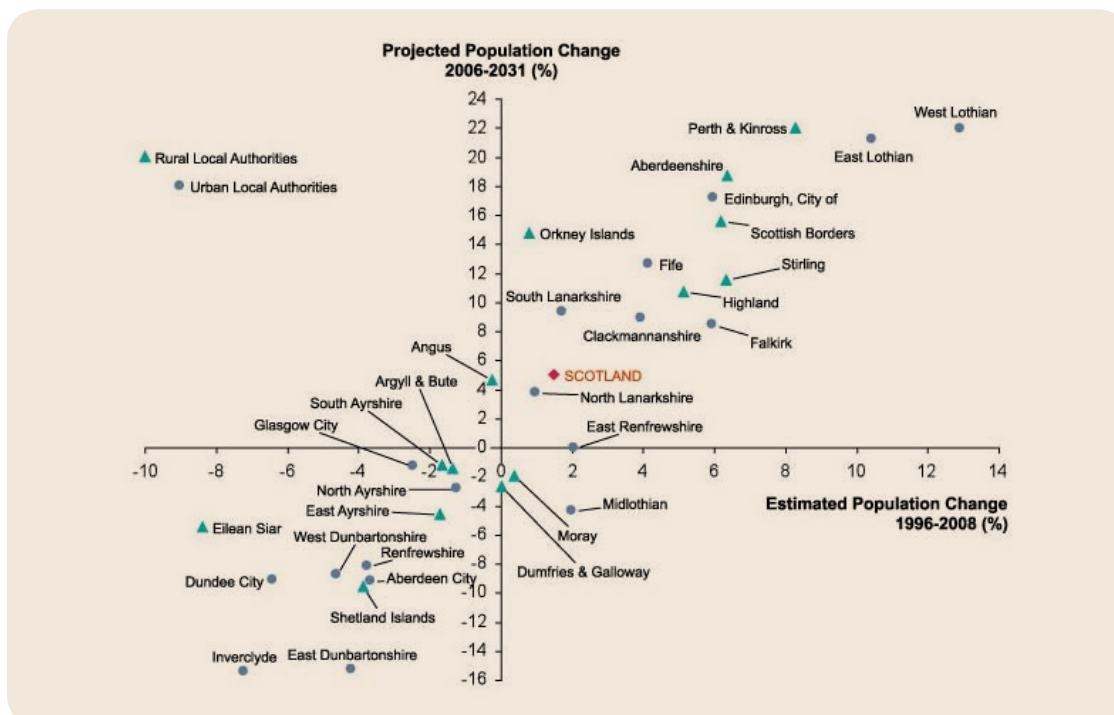
**Figure 1. Index of Population Change in Scotland 1996-2008 (2000=100)**



Source: GROS, accessed through Scottish Neighbourhood Statistics.

Whilst this reveals that generally rural populations have increased since 2000 it masks significant variances in changes across the country. These differences were acknowledged in the OECD’s recent Report on Rural Scotland<sup>7</sup> where it was observed that “there is still a significant divide between remote and accessible rural areas with regions facing serious challenges in terms of ageing, out-migration, poor economic performance and access to modern services”. Figure 2 reveals that many of Scotland’s more accessible rural Local Authorities<sup>8</sup> that are within commuting distance of the major cities, have experienced population growth of over 5% between 1996 and 2008. In contrast, many of the regions in the west, and the more remote islands, have experienced population decline, with Eilean Siar’s population falling by 8.4%, and Shetland’s by 3.9%. Additionally, Figure 2 highlights that those local authorities that have experienced recent population growth (the x axis) will most likely see this trend continue (the y axis) between 2006 and 2031 (with the populations of Perth and Kinross and Aberdeenshire expected to grow by 22% and 18.7% respectively). Notably, whilst Orkney’s population has only grown marginally since 1996, it is expected to increase by nearly 15% by 2031. In contrast, the more peripheral Shetland Islands are expected to continue to experience a steady decline in population, falling by another 9.6% by 2031. Further, whilst the rate of Eilean Siar’s population decline is set to slow down, it is still estimated to fall by a further 5.5% by 2031.

**Figure 2. Actual (1996-2008) and Projected (2006-2031) Population Change by Local Authority**



Source: GROS mid-year population estimates and 2006-based population projections

<sup>7</sup> OECD (2008), *Rural Policy Review, Scotland, UK*. Paris: OECD

<sup>8</sup> Using Randall’s definition of rural Local Authorities being those containing less than 100 persons per square kilometre.

**Figure 3. Local Population Changes 1997-2008**

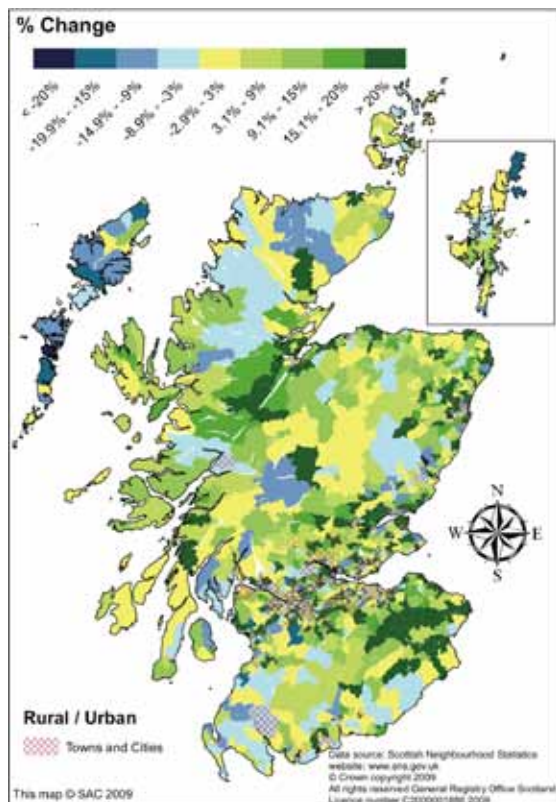


Figure 2 highlighted the significant regional variation in Scotland's population dynamics (both actual and predicted). Figure 3 reveals how the pattern of population change varies significantly, not only between Scotland's regions, but also within those regions. For example, in the Highland Council region, the areas surrounding Inverness have experienced population growth during the last decade, with more outlying areas in Sutherland and parts of Lochaber showing decline over the same period. Across Scotland, whilst many areas have witnessed no or little population change (□), many accessible rural areas are experiencing growth (particularly in the east, but also in the Highlands and Borders), with some areas having growth of over 25%. In contrast, some remote areas, notably in the Outer Hebrides, Ayrshire and Dumfriesshire, have seen population decreases of over 10% since 1997. Table 1 shows the relative populations of those rural and urban areas that experienced population growth (more than 3%), decline (less than -3%) or stability between 1997 and 2008. This shows that, in direct contrast to Scotland's towns and cities where large proportions of the population live in areas of population decline, 50% of the accessible rural, and 59% of the remote rural population live in areas where the population has grown (by more than 3%) between 1997 and 2008.

**Table 1. 2008 population of growing, stable and declining regions 1997-2008**

|                  | 2008 Population by level of population change 1997-2008 |                  |                  |                  |
|------------------|---|------------------|------------------|------------------|
|                  | Declining (<-3%)  | Stable           | Growing (>3%)    | Total            |
| Large Urban      | 944,228   | 379,401          | 682,618          | 2,006,247        |
| Other Urban      | 822,553   | 278,306          | 458,895          | 1,559,754        |
| Accessible Towns | 211,117   | 98,967           | 151,982          | 462,066          |
| Remote Towns     | 97,284  | 36,003           | 53,137           | 186,424          |
| Accessible Rural | 122,162   | 130,641          | 365,150          | 617,953          |
| Remote Rural     | 89,546  | 79,612           | 166,898          | 336,056          |
| <b>Total</b>     | <b>2,286,890</b>  | <b>1,002,930</b> | <b>1,878,680</b> | <b>5,168,500</b> |

### 1.2.2 Population Structure

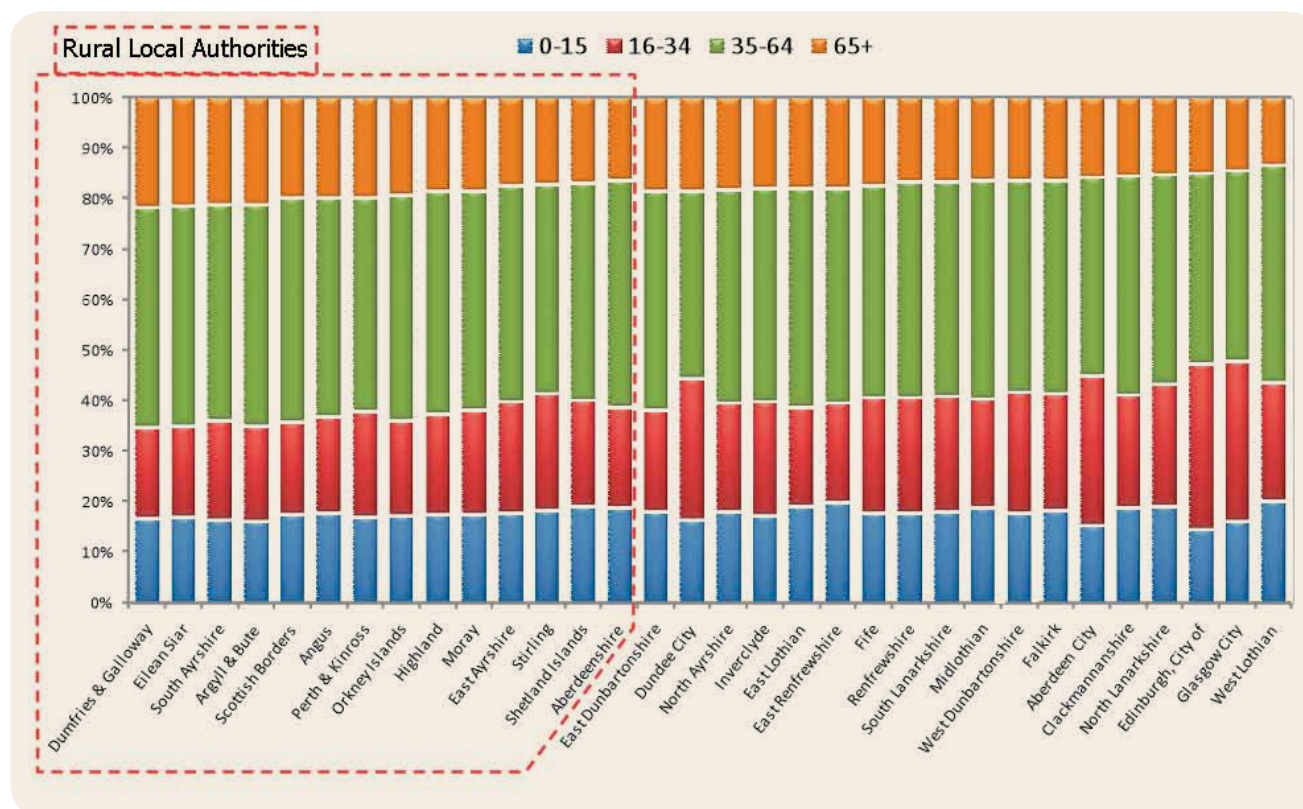
Scotland's population is ageing and ageing fast<sup>9</sup>. The General Register Office for Scotland estimates<sup>10</sup> that the number of people aged over 65 will rise from 16.6% of the population in 2008 to 26% by 2031, with Dumfries and Galloway, Eilean Siar, Orkney, and Angus having the largest proportions of aged populations in Scotland. These projections are a continuation of the existing age distributions within these regions, and Figure 4 reveals that currently nine of the 10 local authorities with the largest proportion of aged people are rural, and specifically that Dumfries and Galloway, Eilean Siar and South Ayrshire already have more than a fifth of their population aged over 65.

<sup>9</sup> For example see: ESRC. (2004). *The Demographic Trends in Scotland: A Shrinking and Ageing Population*. GROS. (2006). *Strategy for a Scotland with and Ageing Population: Policy Briefing Paper on Demography*. Scotland's Future Forum. (2007). *Scotland with an ageing population: economic and demographic changes we should have met by 2031*.

<sup>10</sup> GROS. (2006). *Strategy for a Scotland with and Ageing Population: Policy Briefing Paper on Demography*

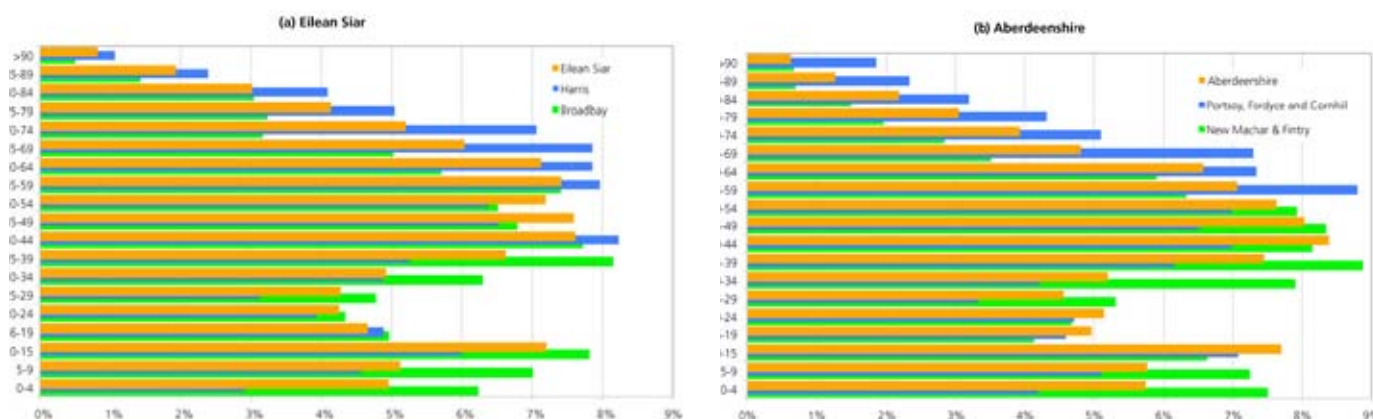


Figure 4 .Local Authority Population Structure, 2008



Whilst Figure 4 allows identification of regions where there are specifically older or younger populations it still masks variations within regions. Using selected examples Figure 5 reveals that, within local authorities, there are often significant differences in the age structures of remote and accessible areas, with the former generally being skewed towards higher proportions of elderly people. For example, in Figure 5(a) the area of Broadbay (around Stornoway) has a much higher proportion of children than Harris (which is more remote) and than Eilean Siar as a whole. Broadbay also has a higher proportion of 30-40 year olds who may have returned from studying or employment in Scotland’s mainland urban areas, in order to raise families. In direct contrast, it can be seen that Harris has a much larger proportion of over 55 year olds than Broadbay or Eilean Siar as a whole, which may in-part be related to the presence of an ageingcrofting population, and in-migration of retirees. A similar pattern can be observed in Figure 5(b) for Aberdeenshire where accessible New Machar and Fintry have much higher proportions of children and 30-55 year olds (commuters and young families), compared to Portsoy, Fordyce and Cornhill (which are remote), and Aberdeenshire as a whole. Correspondingly, Portsoy, Fordyce and Cornhill, have a much more aged population, with a significantly higher proportion over 55 years old.

Figure 5. Population structure within local authorities



Source: GROS, accessed through Scottish Neighbourhood Statistics

**Figure 6. Aged Dependency Ratios<sup>11</sup>, 2008**

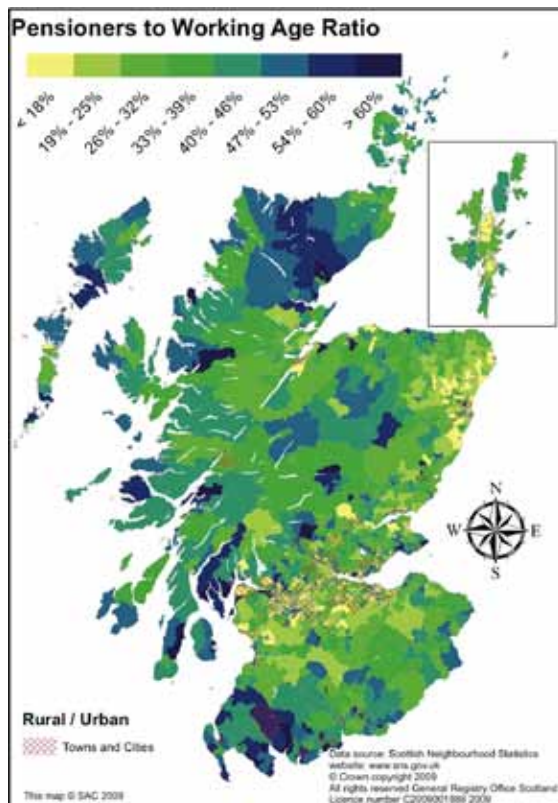


Figure 6 shows the proportion of pensioners in an area compared to the working age population (so a figure of 1.2 would mean there are 120 pensioners for every 100 people between the ages of 16-65). This reveals that the rural areas of Scotland which have very low proportions of pensioners (yellow and light green) tend to be located in accessible rural areas within commuting distance of the major urban centres. In contrast, the areas where there are very high proportions of pensioners to working age people are more peripheral, with concentrations in the Outer Hebrides, Sutherland, Dumfries and Galloway and Argyll. Within these regions there are many local areas where more than a quarter of the population are pensioners. This means that, whilst the Scottish Government is considering how to meet the consequences of an aging population across Scotland by 2031, there are many areas that are already experiencing that scenario. Aged, and ageing, populations have implications for local public and private service provision, relating to differences in consumer tastes and shopping patterns, health care needs, transportation requirements, and so on.

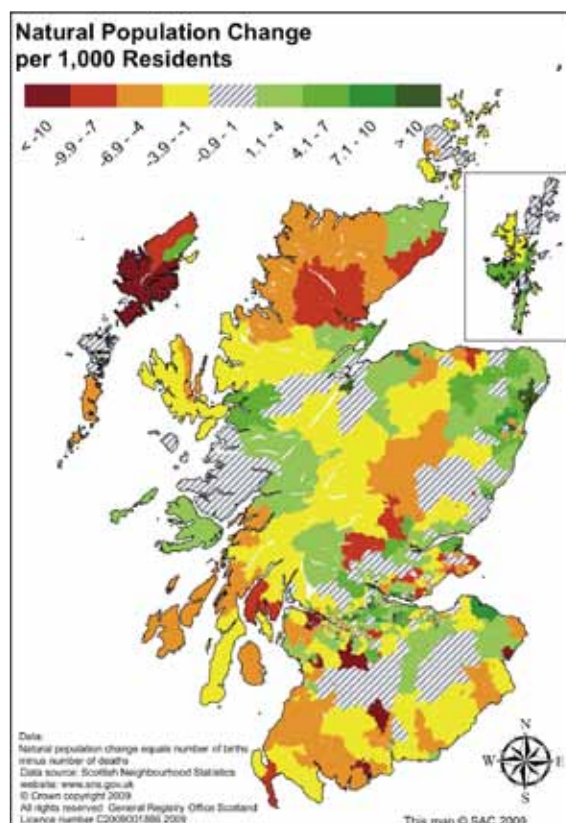
### 1.2.3 Migration and Natural Population Change

The disparity of population structure between Scotland's accessible and remote rural areas has been shown above using specific examples, but there are general trends that are observable across most of Scotland. A common element in both accessible and remote areas is that there is outward migration of 16 to 20 year olds who leave to: (a) continue their studies at further or higher education institutes, (b) seek employment and develop a career, or (c) travel and broaden their horizons. A proportion of those who leave will return at some stage, leading to in-migration back into the area. Often this in-migration occurs when urban dwellers have young families and want to bring them up in a rural environment. To satisfy this desire, they migrate from urban areas but since they keep their urban jobs they choose to relocate to

accessible rural areas (hence the high levels of 30 to 50 year olds generally observed in such areas) where there is often a greater choice of housing than in remote areas (more new-build developments, etc). Some academic literature also suggests that cities like Edinburgh and Aberdeen are urban "escalators" whereby influxes of managers and professionals to accessible rural areas displace some residents by escalating house prices in the commuting belt. The second distinct type of migration occurs at retirement age when some people choose to retire from urban and more accessible rural areas to remote areas.

As data on migration is limited, examining the natural population change (births minus deaths) gives an indication of areas where there is downward pressure on local populations because less children are born than the number of deaths occurring (figure 7). Whilst this cannot account for new migrants having children (or dying) it does reveal areas where there are natural downward pressures that, without net in-ward migration, will lead to population decline. When compared to Figure 3, a distinction can be made between natural population change and change due to migration. Figure 7 also reveals the areas where there are natural population increases (green areas) and this correlates to the accessible rural areas where young professionals relocate from urban areas to raise families. This is most notable in Aberdeenshire and in the central belt of Scotland.

**Figure 7 Natural population change 2005 - 2006 per 1,000 residents**



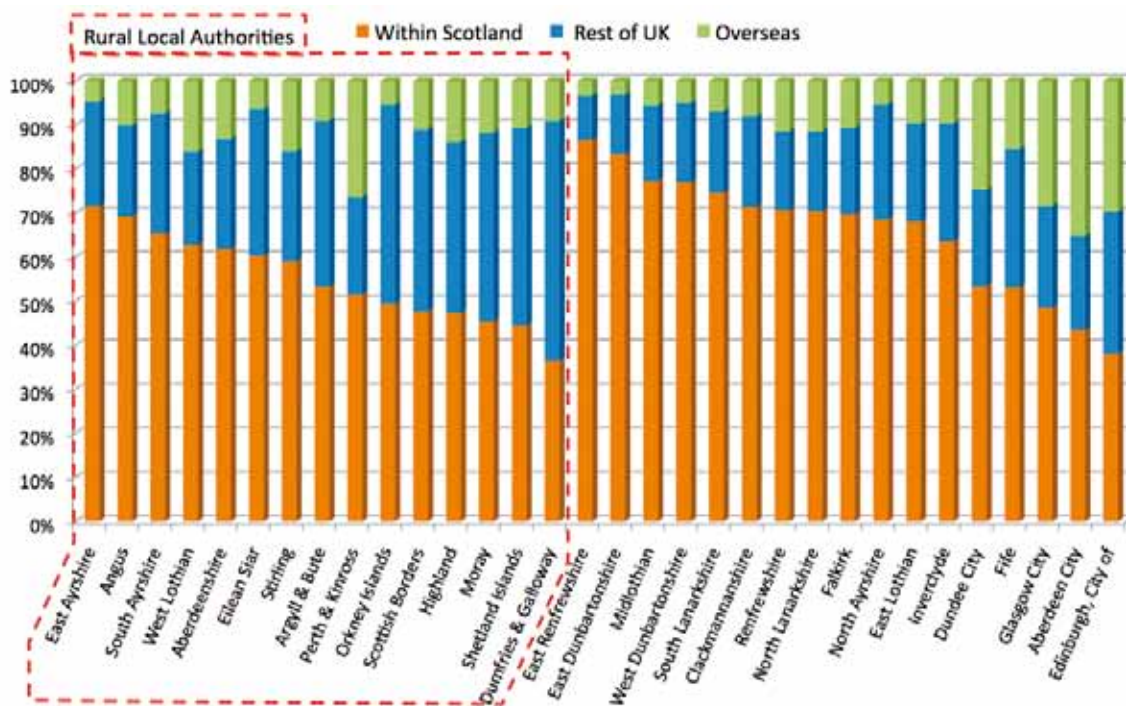
<sup>11</sup> The aged dependency ratio is the ratio of pensionable aged population to the working age population where pensionable age for men is aged 65 and over and for women is aged 60 and over.



In recent years there has been an increased net in-migration to Scotland that is fuelling general population growth. It has been reported <sup>12</sup> that net-migration flows into rural areas are principally determined by the availability of houses, good infrastructure (see Section 3) and employment opportunities. There is often a perception that much of this migration is by foreign nationals, particularly eastern Europeans in recent times.

However, Figure 8 reveals that in 2007-2008, whilst overseas migrants comprised more than a fifth of all migrants to Scotland's cities, they remained a relatively small proportion of migrants to Scotland's rural areas, compared to in-migration from within Scotland and from the rest of the UK. In 2007-2008, areas that had a particularly high influx from other areas within the UK included Dumfries and Galloway, Moray, Shetland, Scottish Borders, Highland, and Orkney showing that many of Scotland's more remote regions are considered by migrants to be an attractive place to live and work. Another positive aspect of in-migration relates to the fact that they tend to be younger than the resident population, with 47% of migrants from the rest of UK, and 67% from overseas, aged 16-34 compared to only 24% of resident population<sup>13</sup>.

**Figure 8. Origin of in-migrants by Council areas, 2007-2008**



Source: data from GROS 2009



<sup>12</sup> SEERAD, (2005), *Crofting and its Role in Population Retention, Income Generation and Environmental Conservation*. Analytical Services Division.

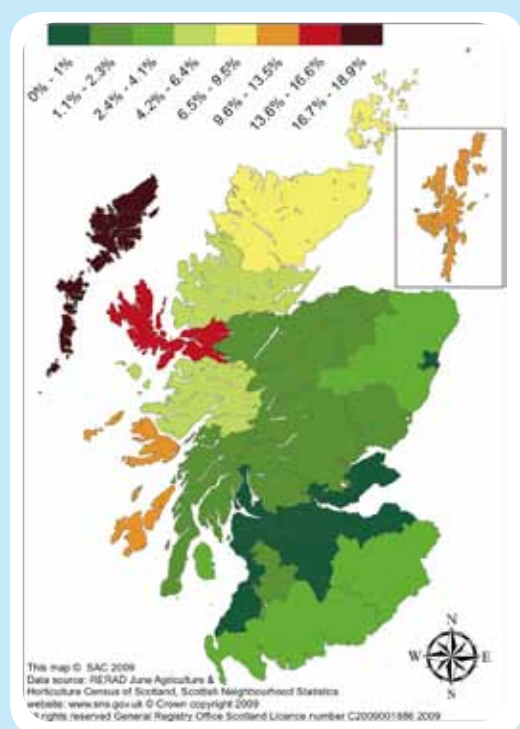
<sup>13</sup> GROS (2009) Mid-2008 Population Estimates: Population Estimates by sex, age and administrative area.

# In Focus: How does agriculture contribute to rural demography?

Steven Thomson and Fiona Williams, SAC

A potential contributory factor to the ageing population in some of Scotland's more remote areas relates to the fact that agricultural households still make important contributions to maintaining the population of many remote communities.

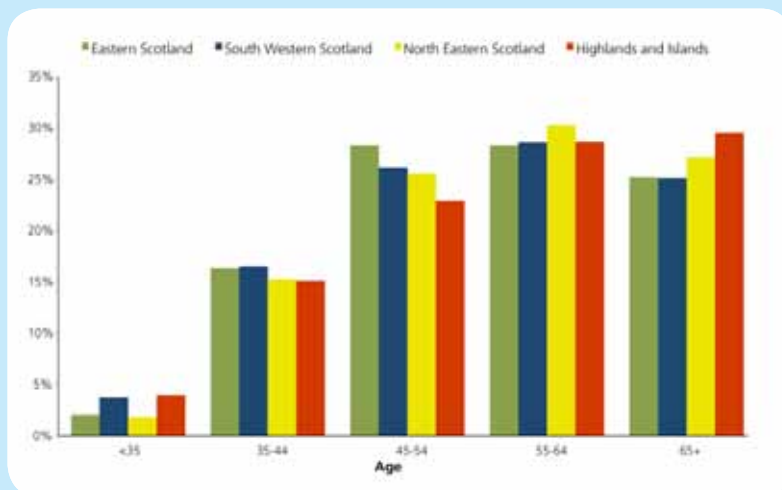
Figure 9 reveals the relative importance of Scotland's agricultural households to the total housing stock across Scotland (where the presence of a farm or croft occupier has been used as a proxy for a main agricultural residence)<sup>14</sup>. Agriculture (largely through crofting) contributes about one in five of all houses in the Outer Hebrides with 14% in Skye and Lochalsh, 11% in Shetland and 10% in the Argyll and Bute Islands. If vacant and second homes and other agricultural residencies are included the relative importance of agriculture increases somewhat. Moreover as these regional figures include dwellings in towns such as Stornoway, Portree, Rothesay and Lerwick the importance of agriculture in the outlying rural areas is significantly higher than represented here. The 10,000 to 12,000 active crofters (with a total crofting population of around 33,000<sup>15</sup>) alongside many farm households play a very important role in the local population dynamics in the north of Scotland.



**Figure 9 Proportion of Farm and Croft Occupiers to Total Dwellings<sup>16</sup>**

The age structure of Scotland's agricultural population can therefore be a contributory factor in the demographics of many remote rural areas, particularly in the North West. Figure 10 shows how the age structure of farmers (data not including that related to minor holdings and crofts) across Scotland's regions in 2007 was heavily skewed to the older generation with 27% of all farm holders being over 65 years of age and 29% falling in the 55-64 year old group. Within the Highlands and Islands nearly 30% of the farms were held by 65+ year olds and nearly 60% were held by those over 55 years in age. Between 2000 and 2007 the proportion of farm holders under 35 fell by 53% with the number of holders in the 35-44 category falling by 23%. During the same period, 55-64 year old farm holders increased by 6%, and 65+ year olds by 17%. If the spouses of farm holders are accommodated in these figures coupled with anecdotal evidence that points to a croft population heavily skewed to older people, an ageing agricultural population can in part help to explain the population dynamics in some of Scotland's more remote communities, in particular those areas in the North West and Islands.

**Figure 10 Age of Scottish Farm Holders, 2007<sup>17</sup>**



<sup>14</sup> The inability to match datasets means that this is only available at NUTS IV level which in turn means that the importance of agricultural households in some parishes is somewhat masked by averaging out across towns and cities within the region. Moreover, the proxy of using occupiers does not take into account other agricultural housing for workers and family members which are in use on many farms across Scotland.

<sup>15</sup> Crofters Commission [www.crofterscommission.org.uk](http://www.crofterscommission.org.uk)

<sup>16</sup> Calculated using the number of occupiers of agricultural holdings and the total number of dwellings.

<sup>17</sup> Source: Eurostat – EU Farm Structure Survey



### 1.3. What are the challenges of Scotland's changing rural population?

It is difficult to categorise Scotland as a whole because population dynamics are location-specific and are related to a number of factors such as accessibility, education and employment opportunities, landscape, community and social structures of an area. Whilst many in the position to make lifestyle choices think of rural Scotland as an attractive, safe and healthy place to live, the country has an ageing rural population that requires in-migration to maintain viable populations and workforces in many remote areas, although many accessible rural areas appear to be vibrant, with young families and a growing demand for housing. There is a wide range of consequences arising from changing population dynamics, and some of these are discussed in the Economy (Section 2), Communities (Section 4) and Infrastructure (Section 3) parts of this Report. However, to highlight the complexity of the issues surrounding population change, key elements are now summarised.



#### 1.3.1 Ageing Population

In this Section, we are focusing on the challenges that the population structure represents for policy and practice, although it is acknowledged that the positive contribution that an ageing population makes to Scotland's rural communities is considerable, particularly in terms of its voluntary activity and people's cumulative skills and experience which can greatly help the establishment of small social economy and commercial business initiatives for service delivery (see Section 4)<sup>18</sup>.

**Ageing and services:** As Scotland's population continues to age, it will have significant consequences for the public, private and voluntary sectors over the next 20 years<sup>19 20</sup>, and may, for example, require integrated resource frameworks between NHS and local authorities to improve the value for money of joint expenditure in health and

social care. The age dependency ratio is expected to increase across Scotland by between 5% - 7%, and this ageing population will increase the relative burden on public pension provision and health care. Our incumbent "pay as you go" welfare system relies on the revenue generated by the working population to pay for today's public services and state pensions, meaning that, without reforms, the ageing population and increasing life expectancy will place a much greater burden on the working generation.

**Population balance:** In many rural areas of Scotland, where these dependency ratios are already very high, there may be a lack of the human capital that is essential for endogenous development. Without younger people it is difficult for communities to remain viable and maintain their economic functions in the long term. A "cycle of decline" can start, whereby existing businesses relocate, decline or dissolve due to the lack of an appropriately skilled and available workforce. This means there are even fewer employment opportunities which can lead to further out-migration of working age population and youngsters – which in turn means there is even less attraction for new businesses and entrepreneurs to relocate there. On the other hand, it may be argued that the ageing rural population may also give rise to business opportunities for young entrepreneurs to service the consumption demands and healthcare needs of what can sometimes be a relatively wealthy section of society.

**Transport:** Car ownership has grown significantly in rural Scotland over the last 25 years and much of the rural population is highly mobile. However, as the elderly are less likely to drive there may be an increased need for public investment in public transport provision for older people, alongside innovative community transport initiatives that have been emerging in recent years (see Section 3). This provision will be increasingly important in some areas to ensure that the elderly are not excluded from health care, social activities and access to shops, etc.

**Health:** Rural people tend to be healthier but despite our elderly population generally living longer through healthier lifestyles, improved diet, better housing and reduced smoking, it is generally accepted that as people age their health deteriorates, they consult their doctor more often, and use higher levels of prescription medicines. This has implications, particularly for remote rural areas where accessibility to doctors and pharmacies is already difficult for some elderly residents, particularly when they do not have access to private transport. Moreover, the difficulties in attracting health care professionals (especially GPs and dentists) to some more remote locations will need to be overcome (Section 3). There will also be a need for investment in the provision of care homes and home-care facilities in many parts of Scotland in the next decade to meet the healthcare needs of the existing (and growing) older populations.

<sup>18</sup> See for example, the Older For Older (O4O) Project funded by the Northern Periphery Programme, which focuses on more able elderly establishing social enterprises to provide services for the less able elderly. See: <https://www.ruralgateway.org.uk/en/node/1606> and <http://www.o4os.eu/>

<sup>19</sup> See, for example, Bell and Bowes (2006), *Lessons from the funding of long-term care in Scotland*, Joseph Rowntree Foundation: <http://www.jrf.org.uk/publications/lessons-funding-long-term-carescotland>

<sup>20</sup> See also the NHS Shifting the Balance of Care (SBC) with the emphasis on health improvement, anticipatory care, providing more continuous care and more support closer to home. See: <http://www.shiftingthebalance.scot.nhs.uk/>



### 1.3.2. Education and Employment challenges

**Education:** As accessible rural populations are expected to continue to grow and thrive, with a vibrant young population, additional school provision and leisure and recreation activities targeted at children may need to be provided by local and central government. In direct opposition to that trend, in many of Scotland's more remote areas, there will continue to be falling school rolls that may lead to more school mergers and closures than have been seen over the last 20 to 30 years. This may have knock-on effects in the local communities since the education sector is an important employer, schools often adding considerably to the social fabric of areas and an important factor in attracting young families to a specific region<sup>21 22 23</sup>. There are a number of innovative uses of digital technology, and a greater understanding of these and "interschool collaborative co-operation" such as clustering and the New Community School pilots will help identify locally-appropriate options<sup>24 25</sup>.

**Employment:** One of the key drivers of population change in rural Scotland relates to limited job opportunities, particularly a lack of skilled jobs that offer progression opportunities. Additionally, despite the emergence of the University of the Highlands and Islands Millennium Institute, the Crichton University Campus in Dumfries, and Heriot-Watt University's Scottish Borders Campus in Galashiels, there is still a limited range of training and education opportunities meaning that many young people leave, especially from remoter areas, in order to pursue careers and studies. For those youngsters who remain in rural areas the growth in numbers of affluent retirees and commuters means that accessing affordable housing (Section 3) becomes an issue and may lead to their migration to urban areas where there is a wider range of housing, employment choice and access to leisure and recreation. Scotland's workforce is clearly going to be ageing<sup>26</sup> if there is not significant in-migration of younger people, and this may have consequences such as: less employee mobility / voluntary staff turnover (older workers move between jobs less often); increased labour costs (older workers cost more); increased ill health issues; and an ageing stock of knowledge (although it can also be argued that this means more knowledge retention).



### 1.3.3. Accessible Versus Remote Rural pressures

**Counter-urbanisation:** Aileen Stockdale<sup>27</sup> writes about how the key features of trends of counter-urbanisation that have been witnessed in Scotland in the last 20 to 30 years result from increased residential mobility, rural lifestyle preferences, and the involvement of highly educated, qualified and affluent people. This has resulted in rising house prices and the associated issues of housing affordability, a commuting culture with little social or economic contribution to the local area, and an emergence of, and perceived rise in, the phenomenon known as NIMBYism<sup>28</sup>.

Although the current recession appears to have dampened the rate of housing development in rural areas, the continued growth in the population of Scotland's accessible rural areas in the foreseeable future (e.g. Perth and Kinross, parts of the central Borders, Stirling) means that there will continue to be pressures on farmland surrounding accessible towns, and in the wider countryside (for second homes and retirees) to satisfy the need for housing development. This means there may be considerable business opportunities in the construction industries in the accessible towns and surrounding rural areas.

**Migration:** Natural population change is slow and it is now clear that for many areas of Scotland (and indeed for the Scottish Government to achieve its Population purpose target)<sup>29</sup>, net in-migration is the only way that the population and workforce can be maintained and expanded in the short to medium term. It is therefore essential that migrants are welcomed, and that agencies and communities alike ensure that there is effective social and economic integration of new comers (see In Focus Box, Section 3).

### 1.3.4. Population as the backdrop

It is important that the *Rural Scotland in Focus Report* begins with this Section on population change, since the people of Scotland underpin all activity and are obviously essential to its ongoing resilience and vibrancy. The implications of population change for policy and practice are felt across the spectrum, from economic activity, to services and infrastructure provision, to engagement and participation, environmental and biodiversity management and climate change. Thus, the following seven Sections take the underpinning dynamics of population as their backdrop, and investigate related issues in more depth.

<sup>21</sup> See, for example, <http://www.scotland.gov.uk/Resource/Doc/221297/0059501.pdf>

<sup>22</sup> See Scottish Youth Parliament Consultation Response to the Schools (Consultation) (Scotland) Bill, April 2009.

<sup>23</sup> <http://www.srsn.org.uk/documents/SRSN-PR-20090303.pdf>

<sup>24</sup> Dowling, J (2009), "Changes and challenges: Key issues for Scottish rural schools and communities", *International Journal of Educational Research*, Vol 48(2): 129-139.

<sup>25</sup> <http://www.literacytrust.org.uk/database/community.html>

<sup>26</sup> Scotland's Future Forum (2007) *What are the Future Consequences of an Ageing Rural Population? Scotland with an ageing population: economic and demographic challenges we should have met by 2031* <http://www.scotlandfutureforum.org/assets/library/files/application/1213704292.doc>

<sup>27</sup> Stockdale, A. (2010) "The diverse geographies of rural gentrification in Scotland". *Journal of Rural Studies*, 26(1): 31-40

<sup>28</sup> Not In My Back Yard – with reference to development.

<sup>29</sup> To match average European (EU15) population growth over the period from 2007 to 2017

## 2. How resilient is the rural economy to the current economic crisis?

Cesar Revoredo-Giha, Alan Renwick, Fiona Williams and Chrysa Lamprinopoulou

### Key points:

1. For Scotland as a whole, the extent of the current recession is reflected in the fact that Gross Value Added (GVA) was 3.26 per cent lower in the year ending the second quarter of 2009 compared with the previous year.
2. However, not all industrial sectors have been hit to the same extent. For example, agriculture and food industries have fared better than the construction and textile industries.
3. The economies of rural and urban areas are becoming increasingly similar in terms of structure with service industries dominating (in terms of output and employment). They are also inextricably linked and economic shocks that hit urban areas also hit rural areas.
4. However, there are differences in structure between rural and urban areas highlighted by the relative importance of such sectors as agriculture, food and hotels and catering.
5. According to our estimates, these differences in structure coupled with the uneven impact of the recession means that rural areas have been slightly less affected than urban areas by the current crisis.
6. Although rural areas might have been more resilient to the current recession there are still a range of threats to their future prosperity. These include the possibility of cuts in public spending and reform of the Common Agricultural Policy.
7. A key area where more work is required is in developing our understanding of what needs to be in place so that rural areas can ensure that they grow sustainably as the economy exits recession.

### 2.1. Introduction

The Scottish Government collects and reports a considerable amount of statistical information on the composition and nature of the economy in rural Scotland<sup>1</sup>. The purpose of this chapter is not to duplicate this work, but more to examine whether the data can give us insight into the resilience of Scotland's rural economies. The current economic recession has clearly introduced a major shock into the Scottish economy and it is therefore useful to examine how the rural economy has reacted to this shock as a way of highlighting its overall resilience. This chapter will explore whether rural areas in Scotland have been affected to the same extent as urban areas or whether there are particular characteristics of rural areas that have made them more or less resilient to the current crisis.

At the outset it is necessary to define two of the key terms used within the chapter, namely what is understood by the rural areas and how we interpret resilience within the context of this analysis.

In terms of rural areas, two definitions are used<sup>2</sup>:

- (1) The Scottish Government definition of rural areas which comprises:
  - Accessible rural areas (those with a less than 30 minute drive time to the nearest settlement with a population of 10,000 or more) and
  - Remote rural areas (those with a greater than 30 minute drive time to the nearest settlement with a population of 10,000 or more)
- (2) Randall's definition, which is applied to local authorities and to the Nomenclature of Territorial Units for Statistics level 3 (NUTS-3).

The need for two definitions of rurality arises from the limitations of the available statistics, particularly in terms of reporting regional output. It is important to note that the two definitions may produce different results as regards what is rural. In particular, the second definition may define as rural some areas that have an urban component. In fact, this rural definition has a population that is 61 per cent greater than the accessible rural areas and remote rural areas together and the average population density for the rural areas according to Randall's definition is 22 persons/km<sup>2</sup> whilst the population density for remote rural areas is 7 persons/km<sup>2</sup> and for accessible rural areas is 31 persons/km<sup>2</sup>.

Whilst accepting that there is considerable debate surrounding the meaning of resilience, in this chapter we simply consider that an area is resilient if the current economic downturn has affected it less than the average for the Scottish economy (i.e., than the rest of Scotland). Therefore, the comparison is undertaken using the same indicators that define the economic downturn in the Scottish economy (e.g., Gross Value Added (GVA) and employment).

This Section begins with a brief description of the economic recession in Scotland and includes an analysis of the extent to which different economic sectors have been affected. Then we describe the structure of the rural economy. This is necessary because the above definitions of rural are set in terms of demographic variables and distance to large urban areas and do not define the rural economy and how this is different from the rest of Scotland. It is important to define and compare the make up of the rural economy with the urban economy because the more similar they are, the more likely they are to be vulnerable to the same factors. The final part brings together the analysis to try to answer the question of whether the rural areas have been more or less vulnerable to the current crisis.

<sup>1</sup> As reported in the *Rural Scotland Key Facts: People and Communities Services and Lifestyle Economy and Enterprise*. Series of publications. Available online at: <http://www.scotland.gov.uk/Publications/2009/06/19142408/1>

<sup>2</sup> Granville, S., Mulholland, S. and Staniforth, J. (2009) *Use and understanding of the Scottish Government urban rural classification*. Available online at: <http://www.scotland.gov.uk/Publications/2009/08/07115535/14>



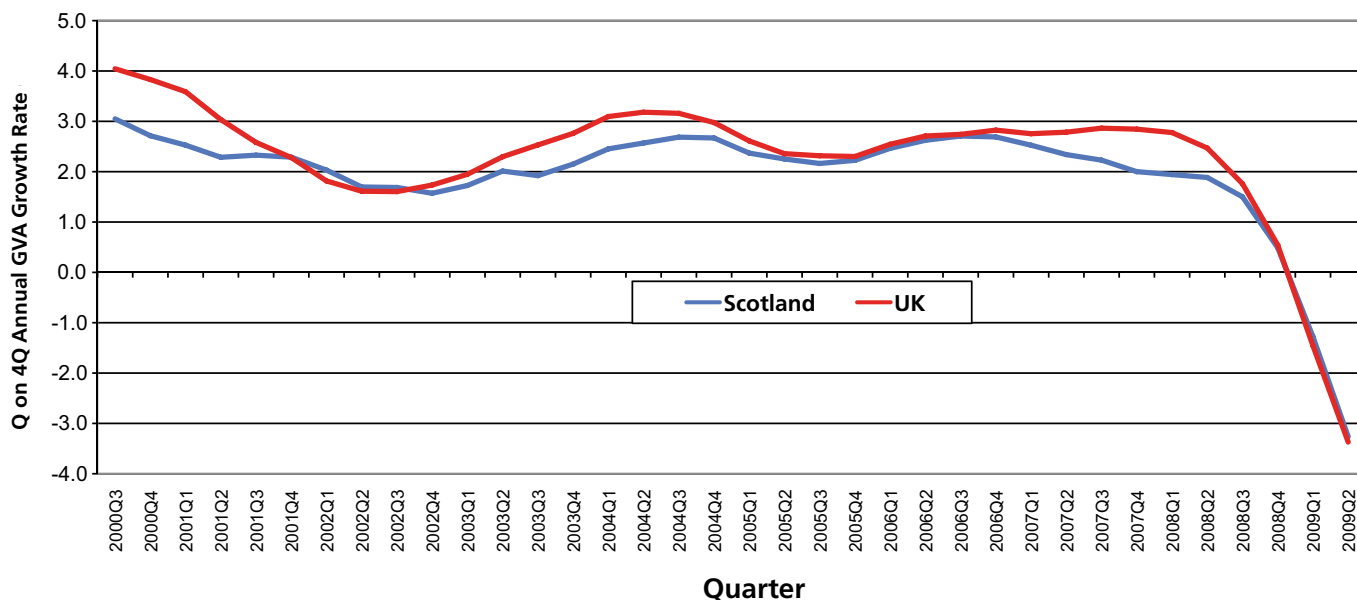
## 2.2. The economic downturn in Scotland

Whilst there are many complex aspects to the recession in Scotland, this brief analysis focuses on three key sets of indicators: (1) economic activity as measured by Gross Value Added (GVA), (2) employment indicators and (3) access to credit indicators. The reason for distilling the analysis down to these three indicators is that they not only characterise the current economic downturn but also help the analysis of the resilience of the rural economy to the current crisis.

### 2.2.1 Economic activity

The most recent official data on the output of the Scottish economy<sup>3</sup> (Gross Value Added (GVA) measured at producer prices (i.e., basic prices) showed that output contracted by 3.26 per cent over the last four quarters when compared to the previous four quarters. Figure 1 highlights that these rates are similar to those for the UK as a whole.

Figure 1. UK and Scotland: Annual growth of GVA (2000 - 2009)



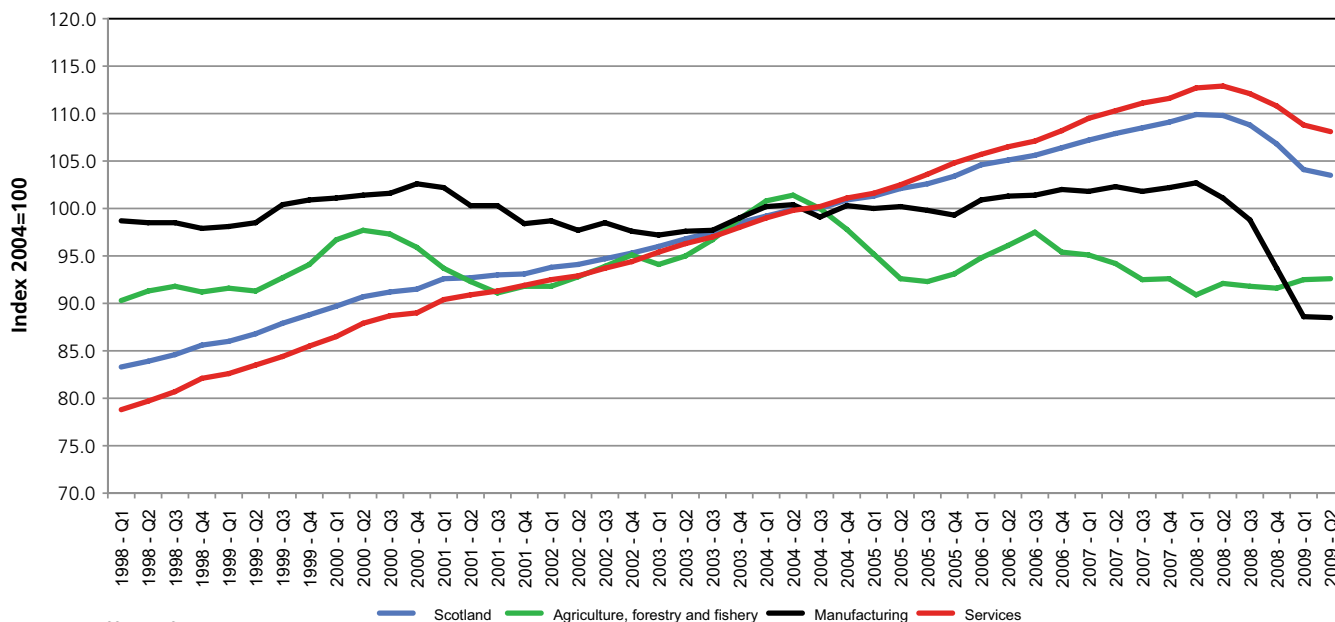
Source: Office of National Statistics.

To date, the recession has been broad-based, with almost all sectors of the economy affected. An exception has been the agriculture, forestry and fisheries sector, which grew slightly by 0.1 per cent over the last four quarters. This is shown in Figure 2 which highlights the evolution of quarterly GVA by the broad economic sectors (agricultural, forestry and fishing, manufacturing and services). Given the dominance of the service sector (which represents 74.2 per cent of total GVA) it is not surprising that the evolution of total GVA mainly follows that of the services sector. The figure highlights that the manufacturing sector was relatively stable before the recession but that it has been quite badly affected by the economic downturn (mostly due to the exchange rate fluctuation and the depression of the foreign demand). In contrast agriculture, forestry and fisheries, have had considerable variability over the period but without being affected by the recent economic crisis.



<sup>3</sup> Goudie, A. (2009) *State of the Economy Presentation*. 21st August. Scottish Government. Available online at: [www.scotland.gov.uk/Resource/Doc/919/0081858.pdf](http://www.scotland.gov.uk/Resource/Doc/919/0081858.pdf)

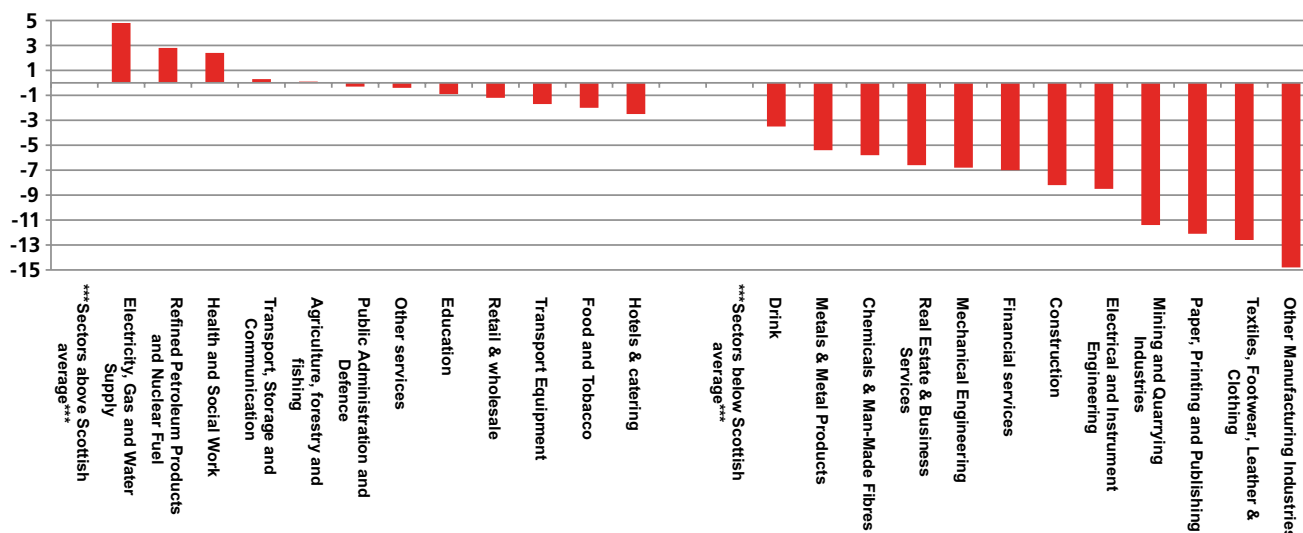
Figure 2. Scotland: evolution of quarterly GVA by broad economic sectors (1998 - 2009)



Source: Office of National Statistics.

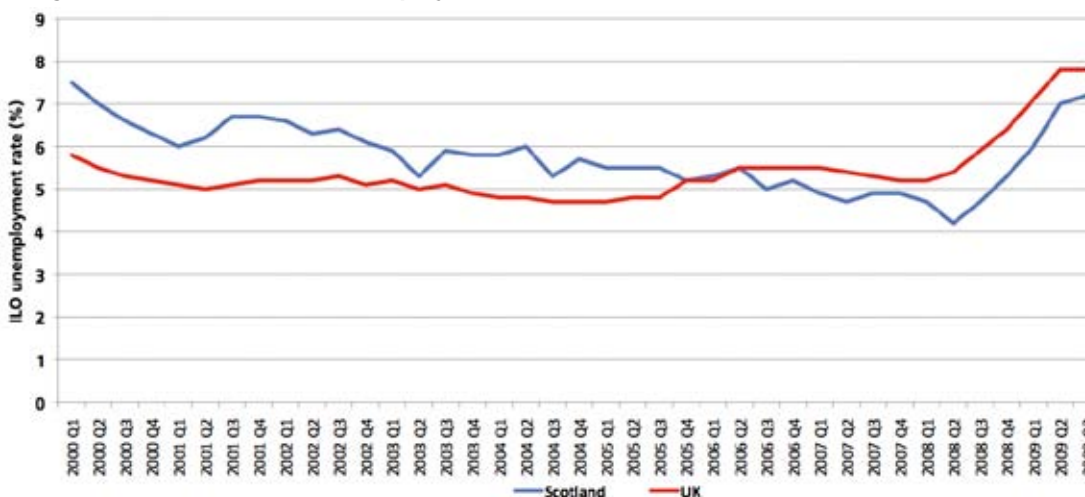
It is important to note that the trends shown in Figure 2 mask a highly degree of variability within the broad sectors as shown in Figure 3, with several sectors performing better (and also worse) than the average of the economy.

Figure 3. Scotland economic sectors: annual growth rate (year up to second quarter 2009)



Source: Office of National Statistics.

Figure 4. UK and Scotland: unemployment rate (2000 -2009)



Source: Office of National Statistics.

## 2.2.2 Employment

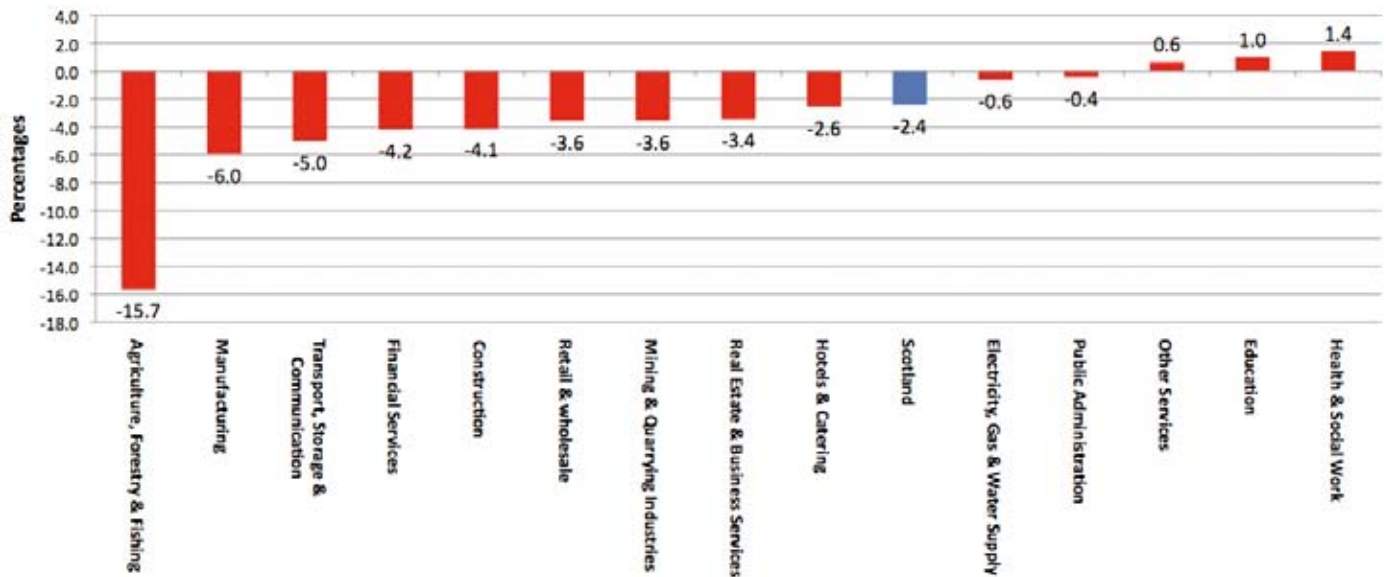
Figure 4 shows the Scottish and UK unemployment rates according to the International Labour Office (ILO) definition,<sup>4</sup> clearly the recession has been reflected in an increase in the rates of unemployment, both in the UK and Scotland.

<sup>4</sup> According to the ILO unemployed people are all those aged 16 and over that are (1) without a job, want a job, have actively sought work in the last 4 weeks and are available to start work in the next 2 weeks, or (2) out of work, have found a job and are waiting to start it in the next 2 weeks.

In terms of the number of employees in different economic sectors (Figure 5) according to the Labour Force Survey, over the year to June 2009, only a few service sectors showed a slight increase (and these were mainly in the public sector). Rather unexpectedly given the fact that the sector has been little impacted by the recession, the largest decline in employee jobs was in the Agriculture, forestry and fishing sector, falling by 15.7%, followed by manufacturing (6%). However, the agricultural, forestry and fishing figures have to be treated with some caution for a number of reasons. First there is a relatively small level of employment in this sector, meaning that relatively small absolute changes can lead to high percentage changes. Second, these statistics are based on a survey and therefore changes in the sample year on year can have a significant impact especially if the sample size is relatively small (for example in the year up to March 2009 the results showed an increase in employment in this sector of 29 per cent). Third, agriculture is characterised by a high level of self-employment which is not reflected in these statistics. Indeed, examination of the results of the agricultural census highlights a much more stable picture for employment (though of course only relating to agriculture and not the forestry or fishing sectors)



Figure 5. Change in employee jobs in Scotland June 2008 to June 2009



Source: Office of National Statistics.

### 2.2.3 Access to finance

One of the key issues surrounding the current recession has been the ability of firms to access credit as banks have tried to manage their risk more effectively. According to the latest statistics, credit conditions remain constrained within Scotland<sup>5</sup>, with an increase in demand for credit (i.e., credit applications) coinciding with a fall in the availability of credit (credit approvals).

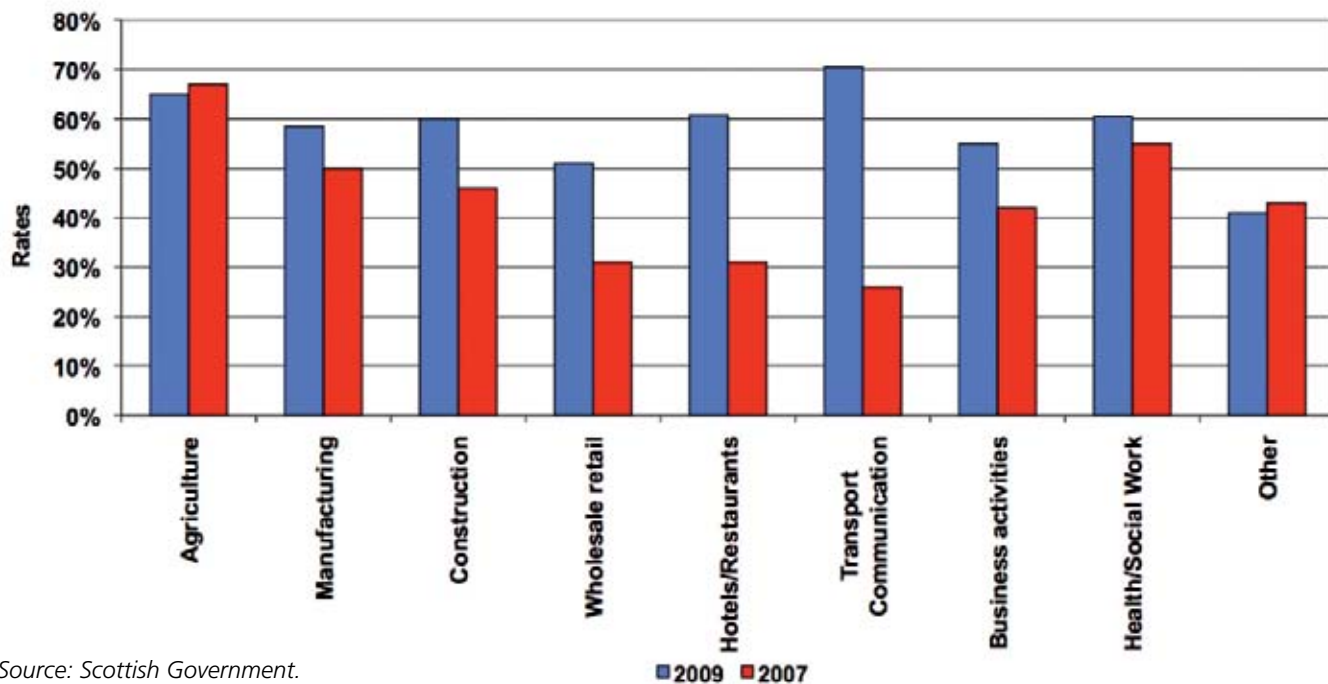
The recent Scottish Government SME Access to Finance Survey (2009)<sup>6</sup>- which is based on responses from Scottish businesses rather than banking institutions - revealed there has been an increase in applications for finance across all types of firms. The proportion of firms applying for credit (irrespective of whether it was granted or not) increased from 39 per cent of all firms in 2007 to 53 per cent in 2009. Applications for finance tend to increase with size of firm, age of firm and growth. The disaggregation by sector can be seen in Figure 6.

<sup>5</sup> Goudie, A. (2009) *State of the Economy Presentation*. 21st August. Scottish Government. Available online at: [www.scotland.gov.uk/Resource/Doc/919/0081858.pdf](http://www.scotland.gov.uk/Resource/Doc/919/0081858.pdf)

<sup>6</sup> The Scottish Government (2009c). *SME Access to Finance Survey*. Available online at: [www.scotland.gov.uk/Resource/Doc/237655/0065264.pdf](http://www.scotland.gov.uk/Resource/Doc/237655/0065264.pdf)



Figure 6: Demand for finance rate by sectors, excluding zero employee firms 2007-2009

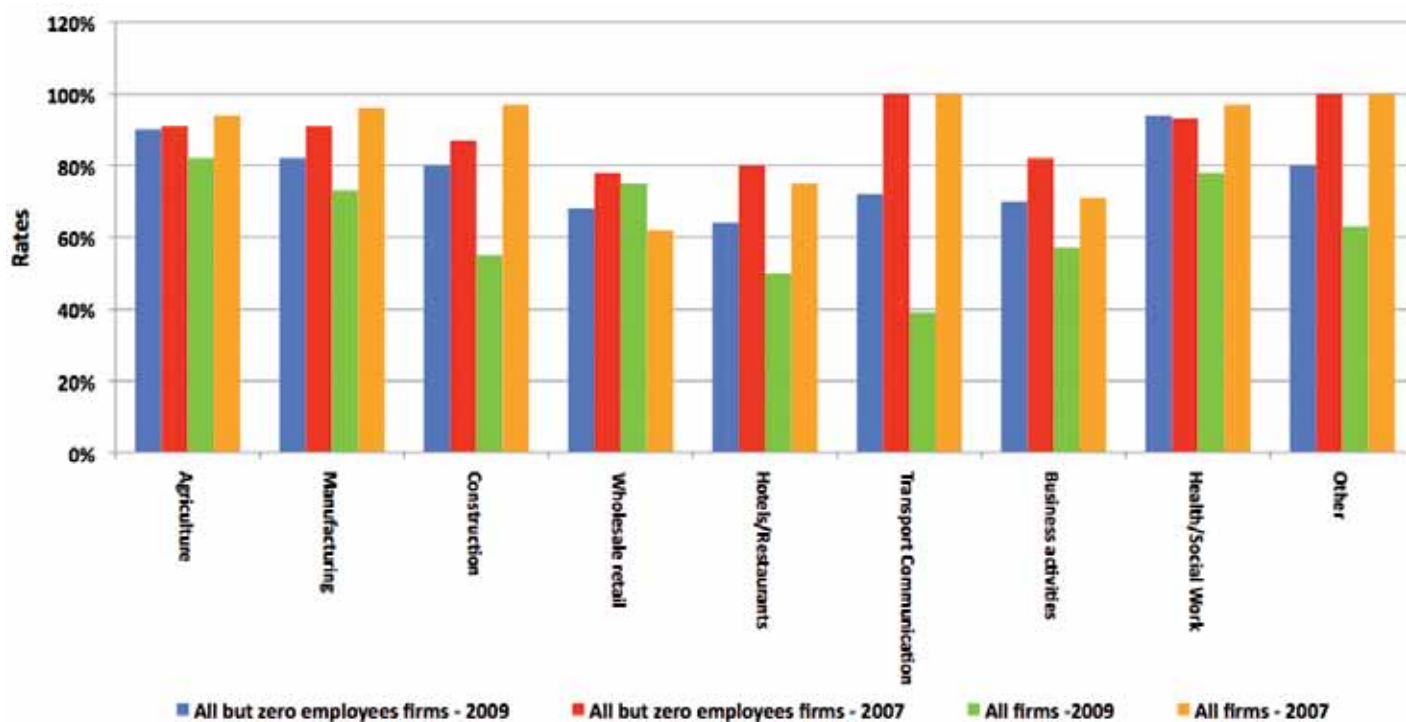


Source: Scottish Government.

On the supply side for credit, there is evidence that the supply of finance to SMEs in Scotland has fallen. The approval rate for applications has fallen, particularly for micro firms (less than 10 employees) where only 60 per cent of firms have been able to secure any proportion of the finance sought compared to 82 per cent in 2007. The likelihood of applications being approved increases with firm size. The supply of finance to high-growth firms appears to have reduced dramatically with only 44 per cent of applications being approved in 2009, compared to an approvals rate of 79 per cent in 2007. This compares to approvals for non-high growth firms being 68 per cent in 2009, a reduction of 18 percentage points since 2007. This fall in supply reflects a combination of factors including the apparent attempt of financial providers to manage risk more effectively in the current economic climate by tightening the credit application process and increasing the requirements for applications for credit.

It is important to note that all sectors face increasing difficulties in accessing finance, with transport & communications, hotels & restaurants, real estate & business and wholesale & retail reported as being the hardest hit sectors in Scotland.

Figure 7. Rate of approvals by sectors 2007-2009



Source: Scottish Government

### 2.3. Major features of the economy of rural areas

The parameters that define the label of "rural area" are population density or distance to a larger more densely populated area. These parameters, however, do not identify the characteristics of the rural economy (e.g., principal economic activities). Therefore, it is useful to consider whether there are particular economic activities that characterise the economy of those areas defined as rural, or whether the rural economy is to all intents and purposes the same as the urban economy and subject to the same drivers and influences.

It is important to note that the main constraints to effectively analysing the economic characteristics of rural areas is the availability of detailed statistics at the local level. Therefore, two sets of indicators are used in this section: (1) GVA by broad economic activity at NUTS-3<sup>7</sup> (complemented with information at the level of local authorities for manufacturing and services) and (2) total number of employees by economic activity.

#### 2.3.1 Output by economic activity

Figure 8 shows the distribution of GVA in rural and urban areas and for all Scotland by economic activities (i.e., agriculture forestry and fisheries, production (which includes manufacturing and mining, construction and services) using Randall's definition of rural areas at the NUTS-3 level<sup>8</sup>.

Figure 8. Share of GVA by broad economic activities, 2006

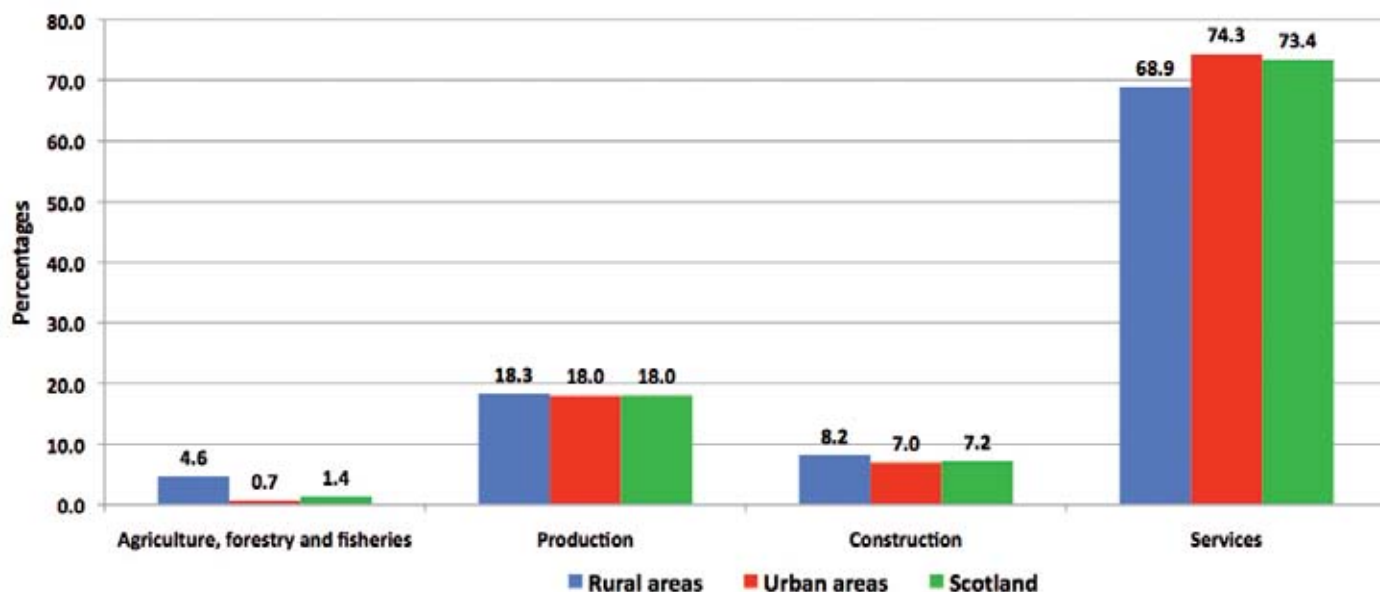


Figure 8 also highlights that there is a strong similarity in the distributions between the rural and urban areas. Not surprisingly, the major differentiation lies in the share of agriculture, forestry and fisheries, which is 4 per cent in rural areas and 0.7 per cent in urban areas. It is important to note that this similarity is increased in part due to the use of Randall's definition of rurality.

The percentages shown in the figure are the result of a trend over time consisting of a decrease in the share of agriculture, forestry and fisheries and also production (i.e., major sectors producing goods) and an increase in the share of services. In this sense, in economic terms agriculture has lost its importance as a characteristic that defines and drives the economy of rural areas.



<sup>7</sup> NUTS stands for Nomenclature of Territorial Units for Statistics.

<sup>8</sup> An exception to this is the region of 'Aberdeen city and Aberdeenshire'. According to Randall's definition this is a rural area. However, in terms of its GVA composition, it follows closely that of Aberdeen city, and was therefore classified as urban.

# In Focus: Perspectives on Agriculture's Contribution to the Rural Economy

As noted previously the agricultural sector has been less prone to the effects of the recession although this is against a backdrop of data that illustrates a long-term trend of decline in the direct economic contribution of agriculture to the economy both in terms of Gross Value Added (in 2008 at 0.8% to the Scottish economy at basic prices<sup>9</sup>) and number of employees in the sector (the total number of employees on main holdings is reported as 19,438 for 2008<sup>10</sup>). In these direct economic terms the role and importance of agriculture as an economic driver of the rural economy has diminished concurrently. In addition, complex adjustments have been taking place in the sector and also with respect to the wider contribution of agriculture, as illustrated below:

1. In terms of the agricultural workforce, a long-term decline in regular, full-time staff (including working occupiers and spouses) is off-set by a concomitant rise in part-time, casual and seasonal employees (also including working occupiers and spouses). While the North-Eastern and South-Western regions (NUTS II) have experienced the greatest decline in employee numbers (for the period 1999-2007)<sup>11</sup> there is considerable diversity at a lower geographical scale (NUTS III), not least due to the opportunities for alternative employment. A corresponding growth in the business activity and membership of Scotland's rural business (machinery) rings (with a combined throughput of £55.22 million and 6,229 members<sup>12</sup>) is also indicative of these restructuring trends.
2. Despite the decrease in share of agriculture on the GVA, its upstream and downstream linkages with other related sectors such as food and trade retailing have remained approximately the same as shown in the input-output tables for Scotland during the period 1998-2004 (two exceptions during the period are the reduction of the multiplicative effect of the oils and fats sector on agriculture and the increase of beer brewing).

While overall the importance of agriculture to the rural economy is widely perceived as diminishing, agriculture remains a mainstay of employment in a number of remote upland areas and continues to contribute to the rural fabric of many of Scotland's rural regions. As indicated in the previous section on Scotland's changing rural population, farming and crofting households comprise a key component of the local economy in remote Highlands and Island areas. Primary industries are also the largest source of private sector employment in these areas. It is likely therefore that through a range of indirect and induced effects agriculture contributes in more ways to the economy of rural areas than is visible at first glance.

In addition there is evidence of wider economic effects, collectively termed the 'halo' effect<sup>13</sup> (Midgley et al., 2008), where agriculture and other land-based industries provide an essential part of the context in which other economic activity takes place. These activities may not be formally linked by the flow of money. The contribution of 'green infrastructure' to the performance of the regional rural economy, through recreation and tourism sectors or in relation to residential choice for example, is not easily measurable. However it may be indicated through the choices of in-migrants to rural areas (particularly accessible rural areas) based on the perceived quality of life to be had in such areas<sup>14</sup>.

Whilst by observing the information by broad economic and firm size there is only a small degree of differentiation between rural and urban areas, a higher degree of differentiation can be obtained by analysing the composition of the specific sectors.

To highlight this, Figure 9 shows the share in the manufacturing GVA of food and drink plus textiles, footwear, leather and clothing (i.e., production of goods closely linked to the agricultural sector) and the share in the services GVA of hotel and restaurants plus retail and wholesale trade (i.e., production of services associated in some measure with the agricultural sector) by NUTS-3<sup>15</sup> areas. Two main observations can be made based on the data presented in the figure. First, there is a high degree of variability in the composition of the areas and second, it is mainly the production of goods that differentiate the structure of the rural areas from the urban ones. With the exception of South Ayrshire and Perth & Kinross and Stirling in all the rural areas the production of the selected goods represents more than 40 per cent of the manufacturing GVA.

<sup>9</sup> The Scottish Government (2009a). *Agriculture Facts and Figures*. Available online at: <http://www.scotland.gov.uk/Publications/2009/06/19142408/1>

<sup>10</sup> The Scottish Government (2009b). *Economic Report on Scottish Agriculture: 2009*. Available online at: <http://www.scotland.gov.uk/Publications/2009/06/16142957/89>

<sup>11</sup> Williams F. and Thomson S. (2008). The consequences for rural communities in SAC's Rural Policy Centre, *Farming's Retreat from the Hills*, pp 36-43.

<sup>12</sup> SAOS (2009) *Annual Report 2009*. Available online at: <http://www.saos.co.uk/documents/SAOSAnnual-R09.pdf>.

<sup>13</sup> Midgley A., Williams F., Slee B. Renwick A. (2008). *Primary Land Based Business Study*, Report prepared for Scottish Enterprise.

<sup>14</sup> OECD (2008) *Rural Policy Reviews: Scotland, UK*. OECD: Paris

<sup>15</sup> The choice of these sectors follows those identified in a study of economic linkages in small towns. SAC/Arkleton Insitute/University of Gloucestershire (2005) *Economic Linkages Between Small Towns and Surrounding Rural Areas in Scotland*



Figure 9: GVA share of specific economic activities by rural and urban NUTS-3 areas

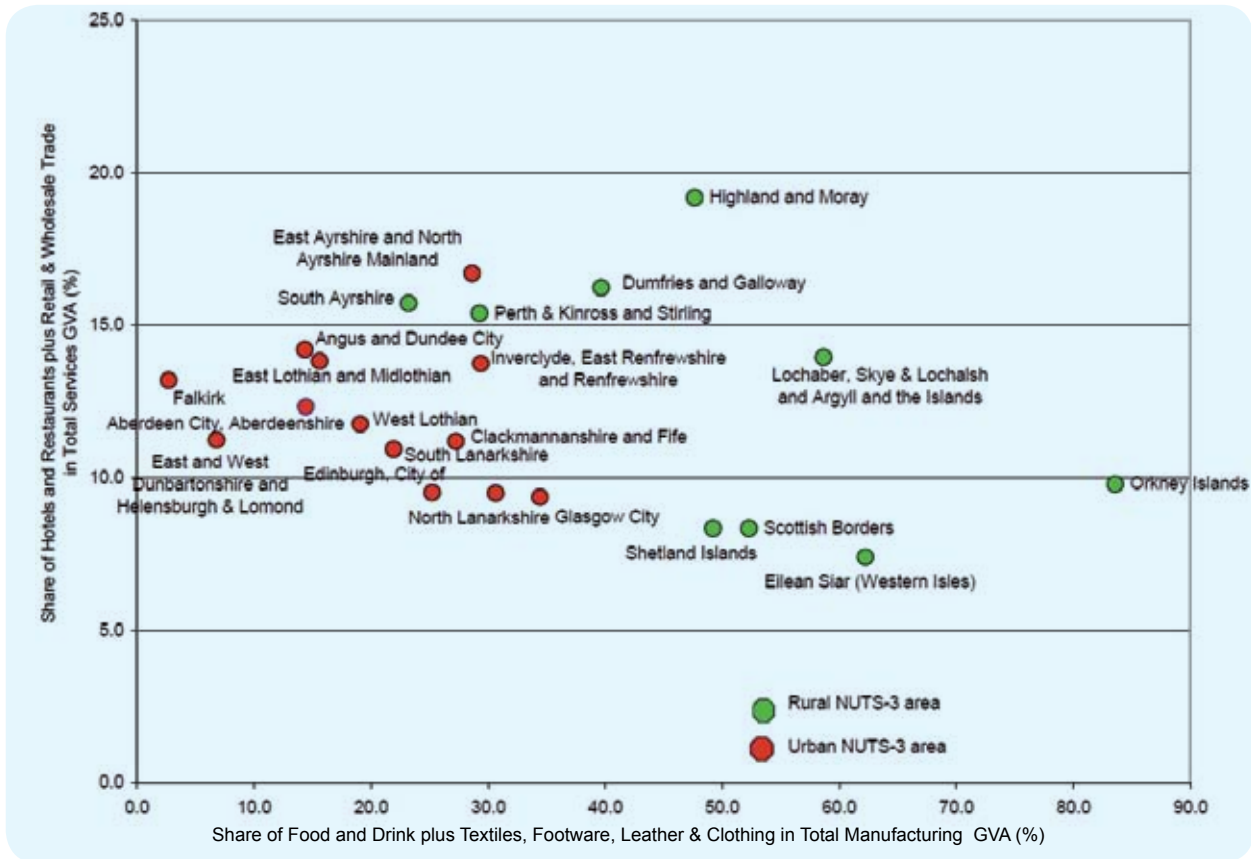
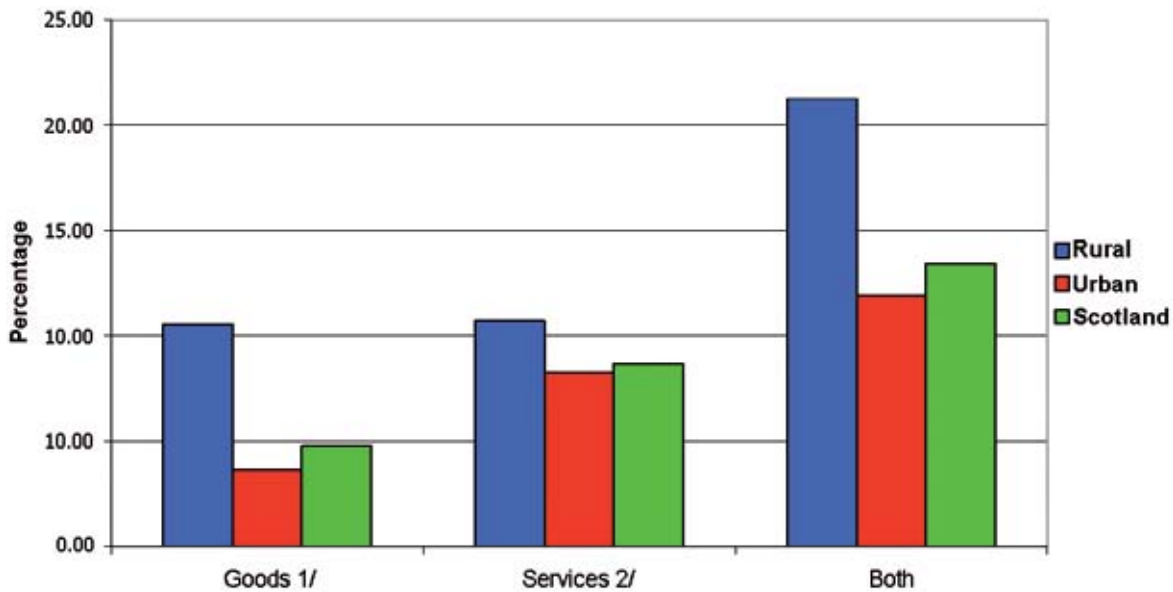


Figure 10 summarises the differences in structure of the rural and urban economy using specific goods and services as examples.

Figure 10. Total GVA share of specific goods and services by rural and urban



Notes:

1/ Goods comprise agriculture, forestry and fisheries; food and drinks and textile, footwear, leather and clothing.

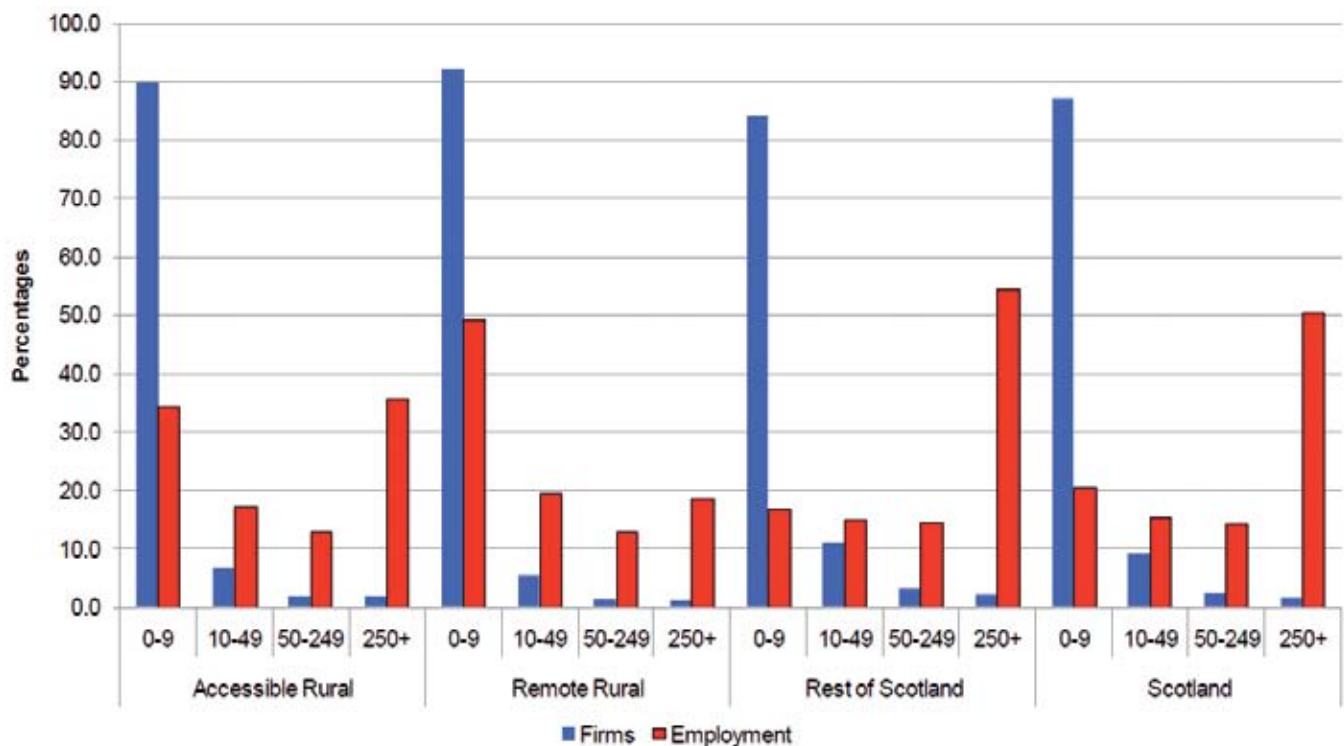
2/ Services comprise retail and wholesale trade and hotels and restaurants.

Source: Based on data from the Office of National Statistics.

A further possibility for differentiation between rural and urban areas may be the size distribution of firms. This is explored in Figure 11, which clearly shows that across all the areas in Scotland, there is a striking similarity in terms of the size of firms (i.e., a high proportion of the firms are small size with 0 to 9 employees), although remote rural and accessible rural areas do have a slightly higher percentage in the 0 to 9 category and urban Scotland a higher percentage in 10 to 49 category. It is important to note that this similarity between rural and urban areas remains even if the information is analysed by economic sector.

In terms of actual employment there is a much more marked distinction between rural and urban firms. A greater proportion of those employed in rural areas are employed by small and medium sized firms (with nearly 50 per cent of employees in remote areas employed by firms in the 0 to 9 category). In addition around 35 per cent of employees in the smallest group work in the agricultural, forestry and fishery sectors.

Figure 11. Distribution of firms and employment classified by number of employees in rural and urban areas, 2008



Source: Scottish Government

### 2.3.2 Employment by economic activity

Figure 12 presents the employment share by sectors<sup>16</sup>. As highlighted in the figure, employment in the primary sector (including agriculture, forestry and fishery) is still an important component of total employment in rural areas. Despite the fact that the service sector (Tertiary and Public Sector) is larger in the rest of Scotland areas (85 per cent), it is still a sizeable part of employment in rural areas (65 per cent in remote rural and 66 per cent in accessible rural areas).

Figure 12. Employment in the Primary, Secondary and Tertiary Sectors and in the Public Sector by Geographic Area, 2008

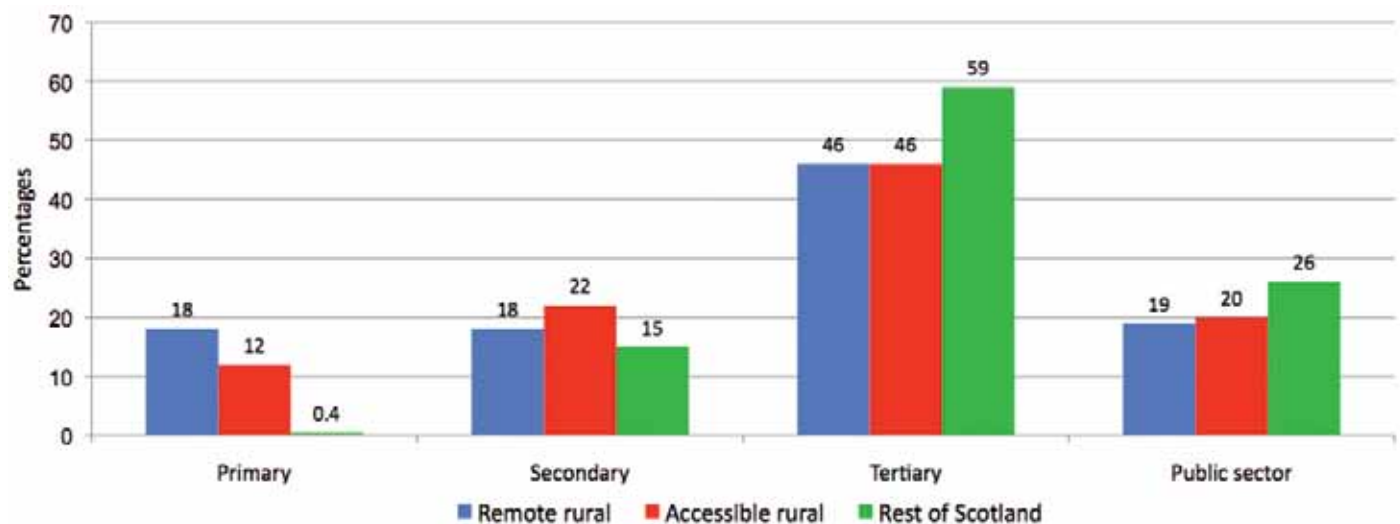


Figure 13 provides a similar analysis to Figure 9, but this time focuses on employment<sup>17</sup>. Again, the production of specific goods associated with agriculture provides a good differentiation of the rural areas from the urban areas as does the share of hotels and restaurants in services employment.

<sup>16</sup> Where primary sector industries are defined as agriculture, forestry and fishing. Secondary industries include energy, mining and quarrying, manufacturing and construction. Tertiary sector industries are made up of wholesale, retail and repair, hotels and restaurants, transport, financial services and education and health.

<sup>17</sup> Note that to increase the degree of differentiation between rural and urban areas, 'wholesale and retail' trade have been removed from the vertical axis.



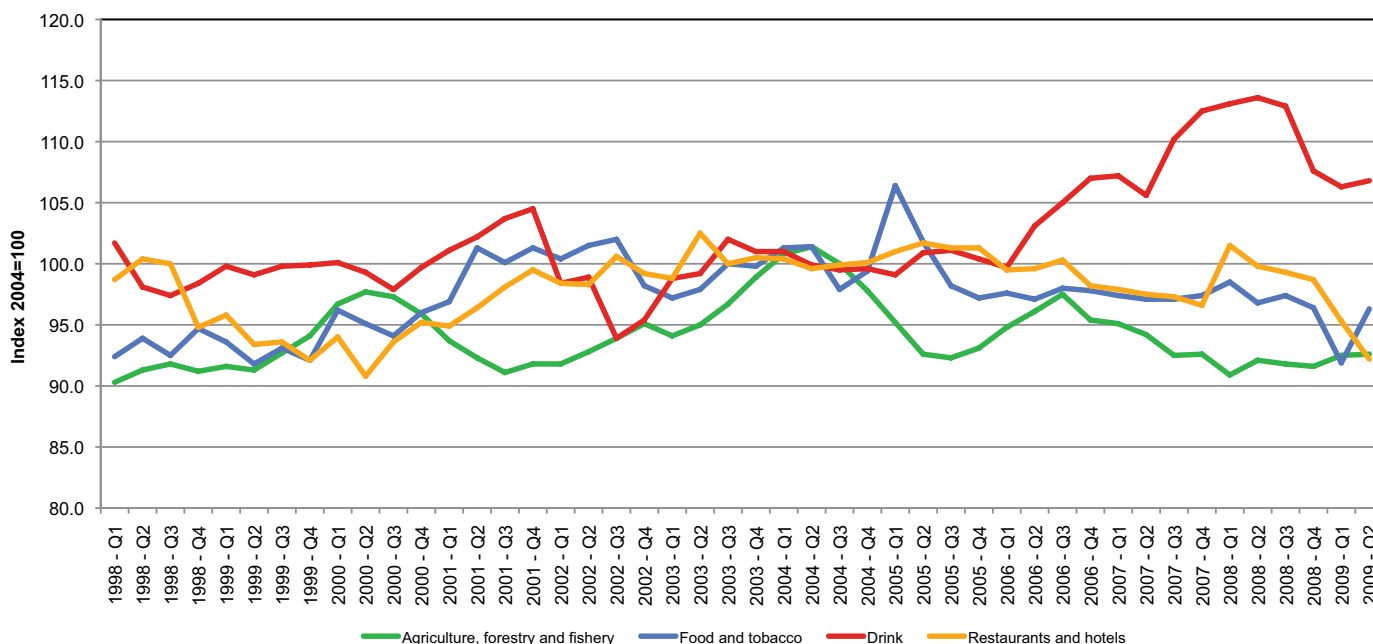


## 2.4. How resilient is the rural economy to the current crisis?

This section brings together the earlier analysis to consider the relative impact of the recession on rural areas.

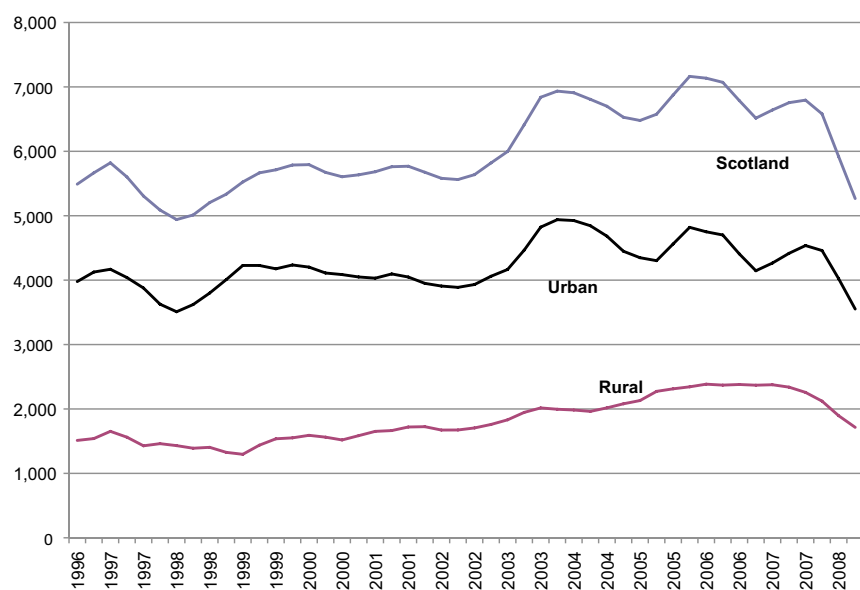
The previous section has highlighted that there are a particular set of industries that are more important to the rural than the urban economy. If we examine Figure 3 again, it appears that these industries have generally out-performed the average for Scotland over the last year. The main exception has been the drinks sector which as highlighted in Figure 15, has been strongly hit; though it should be noted that the restaurant and hotels sector has only fared marginally better than the national average.

**Figure 15. Evolution of GVA for sectors of greater importance to rural areas**

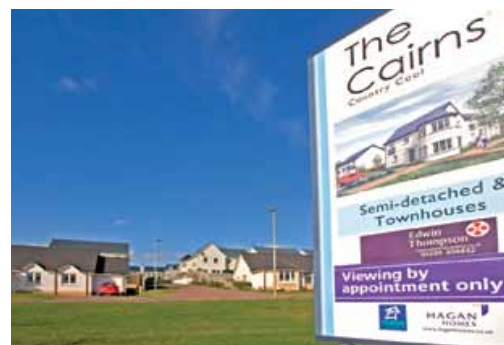


Other available statistics can help the comparison of the impact between rural and urban areas. For example, Figure 16 provides information on new house starts (which can be seen as a good barometer of the state of the economy)<sup>18</sup>. It is clear that construction in urban areas has been hit to a greater extent in absolute terms but proportionately there would appear to be relatively little difference.

**Figure 16. New house starts 1996 to 2008 (seasonally adjusted)**



Notes: Rural and urban as defined by Randall's NUTS-3  
Source Scottish Government



For ease of interpretation the analysis within this chapter has tended to focus on the performance of individual sectors of the economy (food, agriculture etc), however, it is clear that resilience as a whole depends upon the overall functioning of the rural economy and that a holistic view needs to be taken. There is, however, a challenge in summarising the overall impact on rural versus urban areas, because the most recent data available on the relative shares of the sectors at the level of disaggregation needed to differentiate rural and urban areas are for 2006 (that is pre the recession). One, admittedly somewhat crude, way of quantifying the relative impact is to project forward from 2006 to 2009 assuming that all the sectors in both rural and urban areas have grown at the same rate as the economy between 2006 and 2009. This means that any difference identified in the growth rates between urban and rural can be attributed to

<sup>18</sup>The actual data provided by Scottish Government, appears to have a seasonal pattern to it so the data has been seasonally adjusted so that any trends can be identified.

differences in the structures of the economy between the two areas<sup>19</sup>. Through this process it is possible to estimate that the rural economy did decline, similar to the rest of the economy, but to a smaller degree (by -2.36 compared to -3.01 per cent for urban areas). This suggests that over this period rural economy has been slightly more resilient to the current economic crisis.

Although we may conclude that rural areas have been slightly more resilient to this particular crisis, it is important to place this within a wider view of resilience, namely whether rural areas are more or less likely to be affected by other shocks and also whether they are more or less able to take advantage of growth opportunities as the economy emerges out of recession. Given the current state of the finances of the UK, there is much debate about possible cuts in public spending. Concern has been expressed that rural areas are quite heavily dependent upon the public sector and therefore particularly susceptible to such cuts. However, it should be noted that proportionately employment in the public sector is actually lower in rural areas than in the rest of Scotland, the figures being a fifth and a quarter of all employment respectively<sup>20</sup>. In terms of sectors it is also clear that agriculture is heavily dependent on public support and in particular payments from the Common Agricultural Policy. Given the overall state of public finances, these payments are going to become under increasing pressure and there is speculation that the single farm payment may be cut by as much as a third come 2013. Therefore, although agriculture has weathered the current downturn it is possible that regions that are particularly dependent upon it face future challenges.

A key issue is the extent that the economy is diversified. As noted by the OECD, and reported in a recent Lloyds economic bulletin, diversified rural regions tend to have a higher GDP per head<sup>21</sup>. Though it may not necessarily have made them more resilient to the shocks induced by the current economic recession (for example a greater dependence on agriculture in this case would have cushioned a region), it would seem logical that increased diversity would improve resilience to a range of particular threats. The Lloyds bulletin, although noting that data is scarce, also suggests that there is some evidence that diversity can lead to faster growth rates which may mean that they are more able to take advantage of the opportunities as the recession ends.

In terms of the recession ending, it is a commonly held view that export led growth is a way out of recession. However given that rural areas have a lower share of the production of goods and services that are traded internationally, they are less able to take advantage of this route directly. Though they can, of course, benefit indirectly by providing goods and services to firms that are exporting. This indirect link might mean that there could be a time lag between other regions exiting recession and growth in rural areas. Another potential cause of a lag between increased demand and growth could be the lack of capacity due to the shedding of jobs that has occurred during the recession. Even with fairly flexible job markets it is likely to take some time before firms are able to expand employment again and take advantage of increasing demands. This is though not peculiar to rural areas as it affects the whole economy.

Finally, although the rural areas have been slightly more resilient to this crisis it is useful to summarise, along the lines of OECD (2008), the relative strengths and weaknesses of the economy in rural areas in Scotland including those discussed above. This gives us some insight into possible future challenges for the economy of rural areas.

**Table 1. Scotland: Rural economy SWOT analysis**

| Strengths  | Weaknesses   |
|--|--|
| • Stable and diversified economy.  | • Less than optimal tourist offer.                       |
| • Abundant natural resources.  | • Agricultural subsidy dependency.                       |
| • High value-added typical products.   | • Provision of housing.                                  |
| • Quality of life.   |  |
| • Good labour market indicators.   |  |
| Opportunities  | Threats  |
| • Business development and diversification.  | • Forthcoming reductions of EU subsidies and CAP reform. |
| • Forestry and energy sector outlook.  | • Increases in agricultural production cost.             |
| • Growing national and international niche tourist market.                                     | • Secular decrease in agricultural product prices.       |
| • Growing "silver economy".  | • Vagaries of tourist demand. <sup>23</sup>              |
| • There is more interest on supporting regional food producers and buying local. <sup>22</sup> | • Climate change.  |

Source: Based on OECD (2008)<sup>24</sup>.

<sup>19</sup> A more accurate estimate could be produced by considering a more disaggregated structure of the rural and urban areas. However this is not possible due to the fact that important parts of the disaggregated data are suppressed due to confidentiality issues.

<sup>20</sup> Lloyds TSB Scotland (2009) An analysis of the Scottish Agricultural Industry, *Economic Bulletin*, December 2009 No. 89

<sup>21</sup> Lloyds TSB Scotland (2009) An analysis of the Scottish Agricultural Industry, *Economic Bulletin*, December 2009 No. 89

<sup>22</sup> Also it is important to note that according to TNS's Lifestyle statements 2009 versus 2007, fewer consumers agree to the following statements: 'Organic is healthier', 'I would pay more for Organic', 'I should buy more Fairtrade', 'Organic is better for the environment'. TNS worldpanel conference "Survive or Thrive" Client Day 2009.

<sup>23</sup> Tourist demand can be affected, for instance, by changes in the purchasing power of consumers due to variations in the exchange rates.

<sup>24</sup> OECD (2008) *Rural Policy Reviews: Scotland, UK*. OECD: Paris

# 3. What is the future for Scotland's rural infrastructure and access to services?

Clare Hall and Sarah Skerratt

## Key points:

1. Infrastructure and service provision in rural Scotland underpin most activity and well-being. Therefore, there is a need for strategic, cross-sectoral and cross-agency (public, private, voluntary) approaches to infrastructure and service improvement.
2. Online (broadband) and physical (roads, rail, air, sea) infrastructure are equally essential to modern life in rural Scotland. However, high-speed broadband infrastructure is not currently being realised for rural Scotland, and this will continue to have a range of implications, both for businesses and service delivery.
3. The "golden thread" of National Outcomes being achieved through localised solutions (through Single Outcome Agreements) can address challenges of rural infrastructure and service provision, and needs to be specifically assessed.
4. Some impacts of infrastructure improvements such as roads and high-speed broadband may be "desirable" and some "undesirable" for local communities. Impact on community resilience needs to be analysed.

## 3.1 The significance of infrastructure and services

The existence, standard and quality of infrastructure and services are an essential component of rural viability and well-being<sup>1</sup>. In Scotland, the Scottish Government - amongst many players - agree that providing public services that are available and accessible to all, and that are of an acceptable standard to users, will help to achieve a wealthier and fairer Scotland<sup>2</sup>. Further, the quality and pervasiveness of rural infrastructure and services can lead either to "zones of depletion" or "zones of accumulation"<sup>3</sup> in rural areas, and thus are seen as integral to future growth and sustainability of communities.

The challenges of provision have been subject to numerous debates and initiatives<sup>4</sup>, including Rural Service Priority Areas<sup>5</sup>, which have aimed to address the state, standards, equity, and sustainability, where debates also draw comparisons from other countries, notably our Scandinavian neighbours<sup>6</sup>. Typically, however, responsibility for infrastructure and accessible services sits across public sector Directorates, Divisions and Authorities, as well as across private and voluntary sector interests, and thus it is rare to find a coordinated approach to addressing such challenges in rural Scotland. What this means in practical terms for service delivery and infrastructure provision is: high cost per head, limited availability in terms of opening hours, expertise, and coverage, limited choice, potentially poor (or at least extremely variable) quality and ultimately unsustainable provision. We now focus on specific challenges, and examine how they are being addressed.

## 3.2 A focus on affordable housing, fuel, communications and accessible health care

### 3.2.1 Rural housing: Housing affordability

Housing affordability patterns for rural Scotland reflect what we already know of the challenges that a lack of affordable housing can bring to a rural area: younger generations having to move away from their home area (see Section 1), locals being priced out of the market, and targets for growing businesses and providing services more difficult to achieve without the necessary housing for the often lower-paid workforce in rural communities.



<sup>1</sup> See, for example, OECD (2006), pp. 30-31; and EC White Paper (2004), *Services of General Interest*, Section 3.3., p. 8.

<sup>2</sup> See the three service Outcomes of the National Performance Framework, and Scotland Performs: <http://www.scotland.gov.uk/About/scotPerforms>

<sup>3</sup> Copus, A., Johansson, M. and McQuaid, R.W. (2007), "One Size Fits All? Regional Differentiation and Rural Development Policy", *EuroChoices*, Vol 6(3): 13-21. <http://www3.interscience.wiley.com/journal/118516730/abstract?CRETRY=1&SRETRY=0>

<sup>4</sup> See Rural Service Priority Areas (below); see also: (i) SEERAD (2000), *Quality of Services in rural Scotland*. Scottish Executive, Edinburgh; (ii) SEERAD (2002) *Better Communities in Scotland: Closing the Gap*. Scottish Executive, Edinburgh; (iii) SEERAD (2002) *Availability of Services in Rural Scotland*. Scottish Executive, Edinburgh; (iv) SEERAD (2006), *Service Priority, Accessibility and Quality in Rural Scotland*. (v) Scottish National Rural Partnership (2000) *Services in rural Scotland*. Scottish Executive, Edinburgh; (vi) Scottish National Rural Partnership (2002) *Implementing Services in Rural Scotland: A Progress Report*. Scottish Executive, Edinburgh.

<sup>5</sup> CtOG Target H: "By 2008, improve service delivery in rural areas so that agreed improvements in accessibility and quality are achieved for key services in remote and disadvantaged communities": <http://www.scotland.gov.uk/Topics/People/Social-Inclusion/17415/CtOG-targets/ctog-target-h>

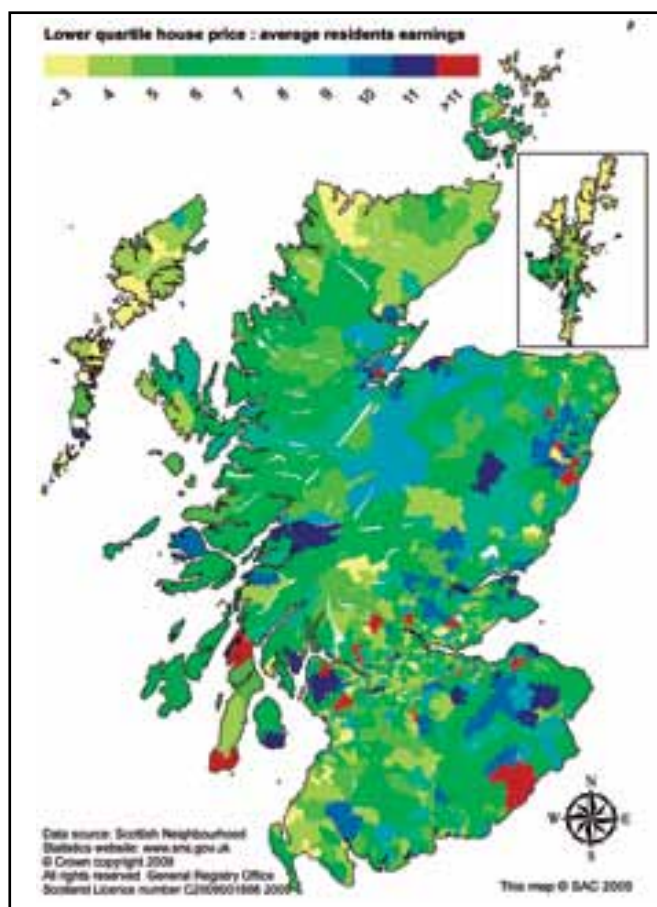
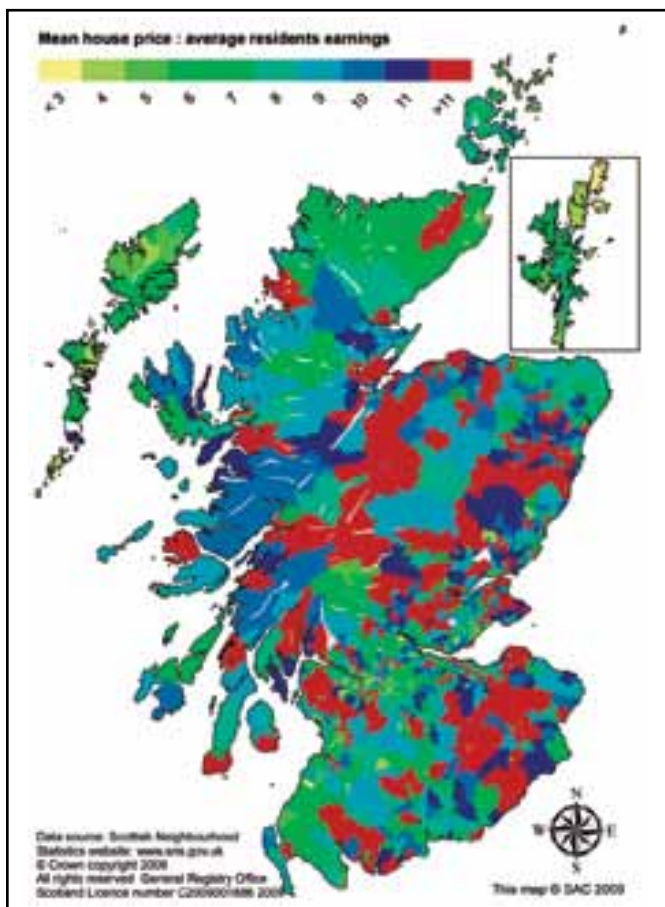
<sup>6</sup> For example, Bryden, J, & Bryan, A. (2005), "What are Sustainable Rural Communities? A Thinkpiece", UHI Policyweb for Commission for Rural Communities, p.12: <http://www.ruralcommunities.gov.uk/files/Sustainable%20Communities%20Thinkpieces.pdf>



Figure 1. shows housing affordability, that is, the ratio of average house price to earnings. The darker areas represent higher ratios, thus less affordability. Areas where the problem of affordability is particularly acute are found in many rural areas in the south east and the north west of Scotland, less so in the far north and the south west.

**Figure 1. Housing affordability - average house price to average earnings ratio, 2008**

**Figure 2. Housing affordability - average lower quartile house price to average earnings ratio, 2008**



The story about the problem of housing affordability is even more clearly demonstrated by figure 2. This shows the ratio of the cost of the lowest 25% of housing to average earnings. Again the darkest colours represent the least affordability and show that there are pockets throughout Scotland where house prices far out-strip average earnings.

### 3.2.2 Rural housing: Energy efficiency, fuel source and fuel poverty

Energy efficiency is measured using the National Home Energy Rating (NHER) which rates dwellings on a scale of 0 (poor) to 10 (excellent) based on the total energy costs per square metre of floor area. The data show that the median NHER rating of rural dwellings is five, compared to seven for urban areas<sup>7</sup>. Further, Scotland has a large number of properties that are off the mains gas grid and which are likely to remain so. Ninety seven percent of dwellings in urban areas are on the gas grid compared to only 41% of dwellings in rural areas<sup>8</sup>. Dwellings off the gas grid are almost five times less likely to have a 'good' NHER rating than those on the gas grid.

Related to this accessibility or otherwise of mains fuel supplies is fuel poverty and its incidence in Scotland's rural areas. A household is defined as being in fuel poverty if it spends more than 10% of its income on household fuel use, and in 'Extreme Fuel Poverty' if a household has to spend more than 20% of its income on fuel.

Thirty seven percent of those in rural areas suffer fuel poverty compared to just over a fifth of urban households. Sixteen percent of rural households are in extreme fuel poverty, making it almost three times as prevalent in rural households as in urban households. Research has shown that the most effective way to remove a household from fuel poverty is to fit a gas central heating system. However many fuel-poor properties are in rural and remote areas where the cost of providing a gas supply would be uneconomic. These areas are thus forced to use more expensive fuels (such as electricity and oil) to heat and provide power to their homes<sup>9</sup>.



<sup>7</sup> Cairns, P., Cormack, D., MacDonald, E., Máté, I., McLaren, D. & Stewart, R., 2007. *Scottish House Condition Survey Key Findings for 2007*. Scottish Government

<sup>8</sup> Source: <http://www.scotland.gov.uk/Resource/Doc/933/0079066.pdf>

<sup>9</sup> [http://www.eas.org.uk/index.php?page\\_id=83](http://www.eas.org.uk/index.php?page_id=83)



Good **electricity grid connection** is essential to the social and economic wellbeing of communities in every part of Scotland. Scotland's grid system needs significant reinforcement to ensure that Scotland can deliver its energy potential, maintain energy supplies to homes, communities and businesses, and meet climate change commitments (see section 5). There are significant challenges relating to grid capacity constraints and infrastructure development requirements<sup>10</sup>.

Further, the growing interest in, and activity around, renewable energy provision, coupled with Scottish Government targets for energy from renewable energy sources (see Section 5), will require an infrastructure which has sufficient flexibility to be able to accommodate renewable and community energy initiatives into the grid in order for them to be financially viable and create a return for rural communities.

### 3.2.3 Communications infrastructure: broadband, roads and mobility

Households in accessible rural and remote rural areas are more likely to have **internet access** at home, compared to the national average<sup>11</sup>. However, households in rural areas that do have access to the internet are less likely to have access to **broadband** than the Scottish average. As might be expected, the more remote rural areas are least likely to have access to broadband, due primarily to availability, cost, coverage and contention (sharing capacity). So although at 99.6% basic broadband coverage Scotland is ahead of most of Europe in terms of broadband availability<sup>12</sup>, the *experience* of rural Scotland's broadband connections is extremely variable, and there are concerns that "basic broadband" speeds of 512KB/sec in many rural villages and townships are falling behind the 16MB/sec available in Scotland's cities. Thus, it is argued that a new "digital divide" is opening up, with those in rural areas feeling that they are less empowered since they now have basic broadband and thus cannot agitate for coverage, whereas what is needed is high-speed or next generation broadband<sup>13</sup>.

The main telecoms providers are far less willing to make the infrastructural investment in rural areas due to low population density<sup>14</sup>, and Universal Service Obligation<sup>15</sup> has yet to be applied to high-speed broadband in Europe. Further, mobile broadband (through laptops or through mobile phones) is also extremely limited in many parts of rural Scotland, since they are reliant upon 3G (or third generation) services<sup>16</sup>, the maps for which show that coverage is largely limited to the central belt and areas in the east<sup>17</sup>. Therefore, the assumed ubiquity of an always-on 24/7 connected culture, is not always appropriate to Scotland's rural areas, due to relative (to metropolitan areas) paucity of the networks<sup>18</sup>.

The Commission for Rural Communities (CRC) highlighted its concerns for rural England in 2008, where there was already a two-tier provision with 42% of the rural population "struggling on speeds below 2Mbps"<sup>19</sup>. They outlined three reasons why this matters, and each of these is relevant to rural Scotland<sup>20</sup>: (i) One third of people working from home live in rural areas. The UK Government is keen to promote home working as a response to road congestion and global warming; (ii) Broadband services can be used by older people to improve quality of lives and offer access to government and health services; and (iii) A high-speed broadband infrastructure would create more rural entrepreneurs which in turn could aid economic recovery.

Further, rural businesses without high-speed broadband access are likely to be at a disadvantage particularly when business-related processes can be completed more efficiently on-line<sup>21</sup>. These include on-line tax returns, funding applications, booking systems for visitor accommodation, website information and advertising and administrative procedures relating to farm business operations. Although many of these can be completed on basic broadband, such activities are often constrained by broadband availability, contention (where

<sup>10</sup> <http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Grid-Connections>

<sup>11</sup> Scottish Household Survey (2009), <http://www.scotland.gov.uk/Publications/2009/11/SHS2009Q2>

<sup>12</sup> <http://www.scotland.gov.uk/Topics/People/BroadbandforScotland/SEBroadbandInitiatives/Facts-Figures>

<sup>13</sup> Farrington, J., Edwards, P. and Skerratt, S. (2009), "Interconnected Society – Benefits and Challenges", Commissioned Paper for RSA Connected Communities Conference and Publication, November 2009.

<sup>14</sup> Skerratt, S. (2008), "The persistence of place: the importance of shared participation environments when deploying ICTs in rural areas", IN Rusten, G. and Skerratt, S. (2008), *Information & Communication Technologies in rural society: Being rural in a digital age*, Edited Research Monograph, published by Routledge

<sup>15</sup> [http://ec.europa.eu/information\\_society/policy/ecomms/current/consumer\\_rights/universal\\_service/index\\_en.htm](http://ec.europa.eu/information_society/policy/ecomms/current/consumer_rights/universal_service/index_en.htm)

<sup>16</sup> <http://www.ofcom.org.uk/media/features/msaone>

<sup>17</sup> [http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/broadband/cellular/3g/maps/3gmaps/coverage\\_maps.pdf](http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/broadband/cellular/3g/maps/3gmaps/coverage_maps.pdf)

<sup>18</sup> Rusten, G. & Skerratt, S. (2008), *Information & Communication Technologies in rural society: Being rural in a digital age*, Edited Research Monograph. Routledge Publications.

<sup>19</sup> <http://news.bbc.co.uk/1/hi/technology/8114694.stm>

<sup>20</sup> <http://www.ruralcommunities.gov.uk/files/CRC104%20Digital%20Inclusion%20Report.pdf>

<sup>21</sup> In addition to the CRC 2008 Report, see, for example: <http://www.farmersguardian.com/putting-rural-businesses-on-the-broadband-map/26210>. article, <http://www.nfea.com/news/rural-businesses-restricted-by-broadband-inconsistency.html>, <http://www.broadbandanalyst.co.uk/uk-broadband/highspeed-broadband-rural-communities/>.

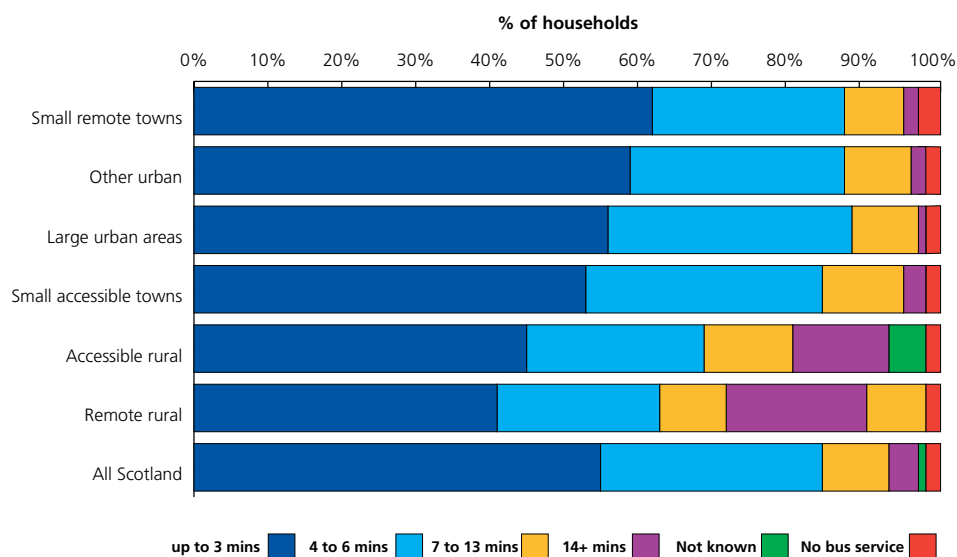
upload and download speed decreases when more people are online), reliability, cost and speeds<sup>22</sup>. Rural voluntary and community groups can be similarly disadvantaged in accessing information and support for their activities.

**Transport** is key for rural areas, for residents and visitors, and for the local economy<sup>23</sup>. This is true for all sectors, whether they be SMEs in the service or tourism industries, the remotely located primary industries of agriculture, fisheries, forestry and energy, or service providers. For island communities ferry services are as vital as road links on the mainland. High transportation costs, and seasonal and weather-related disruptions, are significant challenges for businesses, residents and tourists. The high cost of transport infrastructure (roads, rail, ferry and air) means that "many rural areas still lack adequate access"<sup>24</sup>.



Providing adequate **public transport** in rural areas is both a challenge in itself, and an issue that is closely related to the problems of ensuring access to other services<sup>25</sup>. When considering the availability of bus services, the Scottish Household Survey asks householders about the distance to the nearest bus stop. In 2007 a lower proportion of the population in rural areas lived within a short walk of a bus stop, and a higher percentage of the householders in some of the most remote areas had no bus service (Figure 3)<sup>26</sup>.

**Figure 3. Walking time to nearest bus stop: 2007**



Further, on average a lower percentage of adults living in Scotland's rural local authority areas (72%) find public transport convenient, compared to adults living in urban local authority areas (87%) (Figure 4). There is also considerable variation between rural local authority areas. For example, while 90% of adults in east Ayrshire found public transport convenient, only 50% in Orkney did so.

<sup>22</sup> See, for example, anecdotal evidence from response to December 2009 *Scottish Farmer* Feature on experiences of rural broadband.

<sup>23</sup> See *National Planning Framework for Scotland*, Rural Scotland, points 178 and 179: <http://www.scotland.gov.uk/Publications/2004/04/19170/35348>

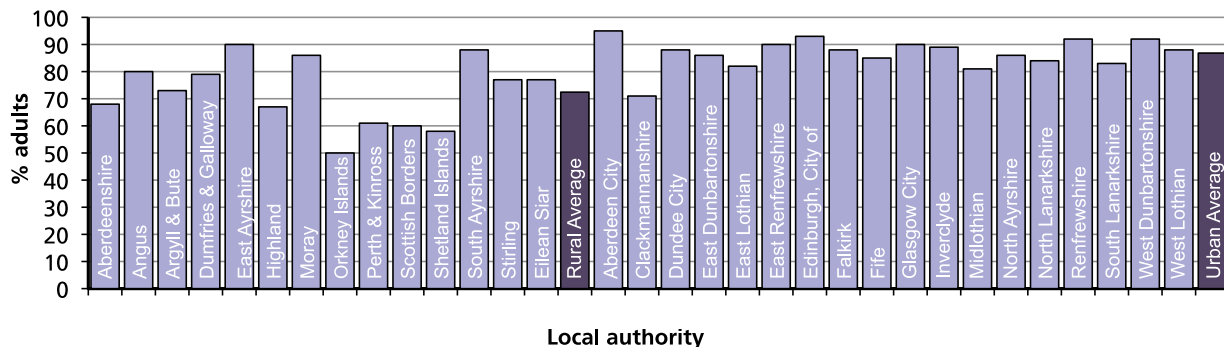
<sup>24</sup> OECD, (2008), *Rural Policy Reviews: Scotland, UK – Assessment and Recommendations*. OECD

<sup>25</sup> OECD, (2008), *Rural Policy Reviews: Scotland, UK – Assessment and Recommendations*. OECD

<sup>26</sup> Source: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendBusServices>

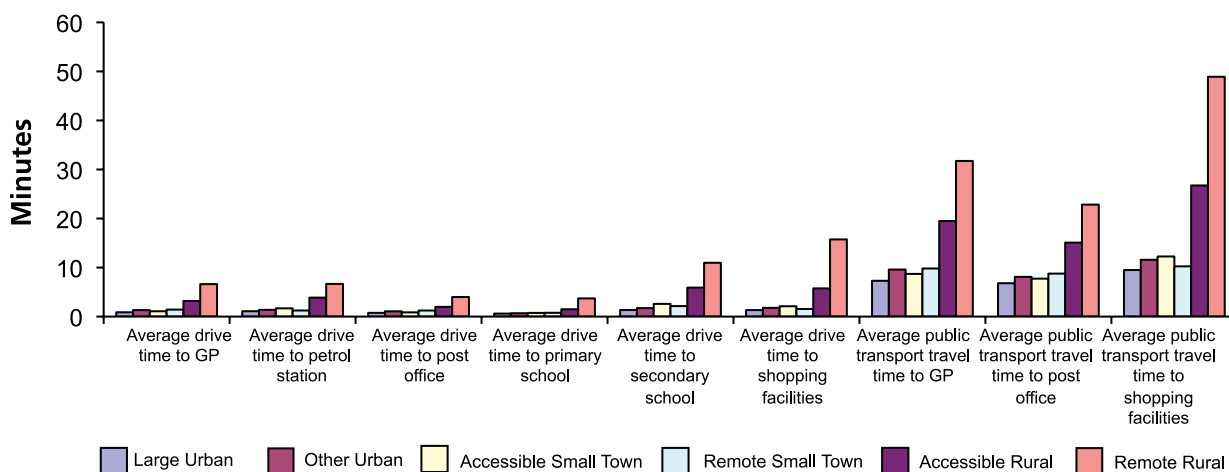


Figure 4. The percentage of adults who find public transport convenient or fairly convenient to use 2005-2006



Data relating to **car ownership** show that, on average, in rural local authority areas, 21% of households are without access to a car, compared to an average of 30% in urban local authority areas. Likewise, on average, 32% of households in rural local authority areas have access to two or more cars, while in urban local authority areas the average is 25%. With more limited transport alternatives, it is to be expected that rural households have to rely more heavily on cars. However, higher prices in rural areas for petrol and diesel mean that travel by car is inherently more expensive in rural Scotland – both in terms of accessing services and work, and for haulage for businesses. Further, data show that without exception, average travel times to a range of services are longer in rural areas than in urban areas.

Figure 5. Average drive times/public transport travel times 2009



There are then challenges in terms of financial cost, time and inconvenience of travel to access services<sup>27</sup>. Over three quarters of the 15% most access-deprived datazones in Scotland are found in accessible rural areas and remote rural areas, and overall, remote small towns, accessible rural areas and remote rural areas have experienced a worsening position since 2006. Further, for eight out of 10 services in remote rural areas, a lower percentage of adults finds access to services “very or fairly convenient” than the Scottish average<sup>28</sup>. In accessible rural areas the same situation is found in relation to all 10 services listed<sup>29</sup>.

What these data begin to show, in composite, is that “accessibility” rather than simply “access” needs to be assessed, as its different facets impact many aspects of rural life and well-being.

<sup>27</sup> See Scottish Index of Multiple Deprivation (2009): Access domain. This covers average drive time to a secondary school, a primary school, a GP, a post office, to shopping facilities, and to a petrol station, and public transport travel time to shopping facilities, to a GP and to a post office.

<sup>28</sup> Source: Scottish Government’s National Indicator five on ‘improving people’s perceptions of the quality of public services delivered’ is a composite measure comprising public perceptions of local health services, local schools and public transport, focusing on issues such as convenience of access to those services.

<sup>29</sup> Ten services: Small amount of grocery or food shopping; chemist/pharmacist; cash machine; Post Office; Doctor’s Surgery; Public Transport; Petrol Station; Banking services; Dentist; Hospital outpatient Department. See: <http://www.scotland.gov.uk/Resource/Doc/283301/0085783.pdf>

# In Focus: Accessibility in rural areas

Professor John Farrington, Director of the RCUK Rural Digital Economy Research Hub

Accessibility can be defined as **'the ability of people to reach and take part in activities and services normal for their society'**. It is important for well-being since it enables social, commercial, educational, health, recreational, and other interactions for the individual, family and social group. It is an essential means of achieving the 'higher order goods' of, for example, education, social interaction, employment and income, and health.

Its importance for well-being can be illustrated by considering some consequences, direct and indirect, of its absence or constrained availability: isolation (physical and social); and impediments to training and job-seeking, shopping, healthcare, and recreational activities.

Mobility is often used as a surrogate for 'accessibility', and taken to be a sufficient condition to achieve the aspects of well-being that accessibility is the key to. Yet accessibility needs are as complex as the lives of the individuals, communities and businesses who experience these needs. A 'simple mobility solution' such as an infrequent fixed-route bus service to a single destination, is unlikely to meet the needs of people of differing ages requiring access to different services in different places at different times.

The provision of mobility and virtual (ICT) mobility is also set in a complex landscape of sectoralised public policy together with private commercial activity. Large quantities of mobility are provided by 'non-transport' public sectors, such as health, education and social work.

The major challenges are to provide a mobility landscape that enables accessibility (physical or virtual) for all, by achieving a socially, economically and environmentally sustainable mix of public and private provision amidst straitened economic circumstances. There are key roles for the public and private, community and voluntary sectors.

## 3.2.4 Challenges for accessible health services in rural Scotland

Given the structure of Scotland's rural population (Section 1) which is rapidly ageing, the demands that this trend puts on health services in particular, and the universal need for health care at some point in rural resident's lives, it is important to focus on such services.

Data<sup>30</sup> show that rural residents' access to various health services, including GPs, hospitals, dentists and chemists, is more difficult than for urban residents. For example, in remote rural areas of Scotland, less than half of the surveyed population found access to a hospital outpatient department to be very or fairly convenient. There are a number of specific challenges associated with providing healthcare in remote and rural areas of Scotland<sup>31</sup>. These include the increasing medical specialisation in training and practice that is unsuited to rural healthcare provision where there is more likely to be a need for medical generalists. There are difficulties in providing patient access to emergency services and indeed in getting emergency response staff to patients.

Further, the European Working Time Directive stipulates working hours, thereby making small rural facilities with limited staff difficult to operate for the required hours. There may also be problems for staff relating to the retention of skills, due to the limited numbers of cases that they may have to treat<sup>32</sup>.

It is argued that local rural services need multi-skilled generalists for service delivery, but medical postgraduate training programmes have no recognisable approach to developing generalism. Concerns about professional isolation and the need to staff on-call rotas have made single-handed medical practices unsustainable. Blanket quality standards raise questions about the number of procedures required for skill maintenance, and risks (or perceptions of risk) associated with infrequent emergency procedures in rural locations, such as emergency caesarean sections. Additionally, rural hospital consultancies have often been difficult to fill, relying on a small number of doctors who find the type of practice and social life attractive<sup>33</sup>.

## 3.3 How are these challenges in infrastructure and services being addressed?

In this section we consider examples of some of the major (national) initiatives and innovations that have been implemented in rural areas to address some of the challenges outlined above<sup>34</sup>. Some examples are Government-instigated, for example in relation to national targets; others are a combination of public, private and voluntary sector initiatives working in partnership, whilst some are local initiatives put forward by local voluntary groups, sometimes with charitable trust funding. This variation in approach demonstrates how these challenges require mixed solutions.

<sup>30</sup> Scottish Government, *Rural Scotland Key Facts*.

<sup>31</sup> See, for example: (i) Farmer J, Philip L, King G, Farrington J, MacLeod M (2010) Territorial tensions: misaligned management and community perspectives on health services for older people in remote rural areas. *Health and Place*, 16, 275-283. (ii) Pitchforth E, van Teijlingen E, Watson V, Tucker J, Kiger A, Ireland J, Farmer J, Rennie A-M, Gibb, S, Thomson E, Ryan M (2009) 'Choice' and place of delivery: a qualitative study of women in remote and rural Scotland. *Quality & Safety in Health Care*, 18(1), 42-8. (iii) King G, Farmer J (2009) What older people want: evidence from a study of remote Scottish communities. *Rural and Remote Health*, 9 (online), 2009, 1166. [Available from: <http://www.rrh.org.au>] (iv) Farmer J, Hinds K, Richards H, Godden D. (2005) Scottish rural and urban health care: a survey of access, satisfaction and expectations. *Journal of Health Services Research and Policy*, 10(4), 212-9.

<sup>32</sup> <http://www.rcpe.ac.uk/publications/rarm/douglas.pdf>

<sup>33</sup> <http://www.rcpe.ac.uk/publications/rarm/shalcross.pdf>

<sup>34</sup> The role of Single Outcome Agreements and Service Delivery Outcomes are also explored in Section 4.

### 3.3.1 Infrastructure: addressing Scotland's affordable rural housing need

In August 2008, the **Scottish Government** announced planned investment of £1.5 billion under the Affordable Housing Investment Programme. This was expected to create at least 21,500 new affordable homes by 2011<sup>35</sup>. This relates to National Indicator 32 – increase the rate of new house building - which, largely due to the economic downturn, decreased by 18% between 2007-08 and 2008-09<sup>36</sup>.

The **Rural Housing Service**<sup>37</sup> provides a range of services to rural communities and individuals throughout Scotland. It helps small communities with funding packages, provides advice and information about issues such as: affordable housing options, sheltered housing, homelessness, land, empty houses, Rural Home Ownership Grants, housing associations, council housing, repair and improvement grants, environmental grants and community finance. They help individuals and communities to explore different practical solutions to housing problems: building new houses, renovating empty property, extending existing houses or developing a new service. Case study examples of local community housing projects include the Laggan Community Trading Company who bought and renovated five empty houses in Strathmashie near Laggan, to let at affordable rents to local families in housing need. In Crianlarich a local community bought and renovated five empty British Rail houses which are now let at affordable rents to local families. The Spittalfield village development project consists of 12 detached bungalows built by local families with the help of Rural Home Ownership Grants (RHOGs).



In addition, **Housing Associations** play an important role in trying to ensure people in rural areas of Scotland have access to affordable housing. There are 132 housing associations and 59 Local Housing Organisations in Scotland that are members of the Scottish Federation of Housing Associations<sup>38</sup>. Further, **Small Communities Housing Trusts**<sup>39</sup>, **Rural Home Ownership Grants**, **Rural Empty Property Grants**, **Rural Homes For Rent**, and **Registered Social Landlords** (RSLs) all have a role to play<sup>40</sup>.

The **Highland Housing Alliance**<sup>41</sup> is a not-for-profit development company that has been set up to help build more new affordable and private houses for people in the Highlands. They work with Housing Associations, landowners and private developers to ensure that as many housing sites as possible are used for new homes. They are especially interested in promoting housing for people who are currently priced out of new build and second hand properties, but who have little chance of a traditional public sector rented house because of demand.

### 3.3.2 Infrastructure: Fuel and Poverty

The **Scottish Government** has set a target to end fuel poverty in Scotland by 2016 "as far as is reasonably practicable". To work towards that target the Government funds the **Energy Assistance Package**<sup>42</sup>. Managed by the Energy Saving Trust, the EAP allows people to talk to an advisor who can suggest how to save energy and money, find lower cost energy rates, advise about benefits and tax credits, and offer free insulation and grants for energy saving measures (depending on entitlement).

Further, gas is distributed to remote areas through **Scottish Independent Networks** (SINS)<sup>43</sup>. The SINS are in five rural towns (Stornoway, Wick, Thurso, Oban and Campbeltown) that are not connected to the National Transmission System but which are supplied with natural gas by road tankers that take LNG from a storage facility to satellite LNG stations<sup>44</sup>.

### 3.3.3 Infrastructure: Communications networks - broadband

Following the completion of the "**Broadband for Scotland Rural and Remote Areas Supply Side Intervention**" (SSI), by December 2005 it was stated that every Scottish community had access to at least basic broadband (512Kbps)<sup>45</sup>. Figure 6 shows the areas receiving broadband coverage because of a range of initiatives. The areas in blue are those exchanges where full broadband is provided by BT without intervention.

<sup>35</sup> <http://www.scotland.gov.uk/News/Releases/2008/05/30104227>

<sup>36</sup> See *Scottish Planning Policy 3 – Planning for Homes (2008)*, which sets out the Scottish Government's policy on the identification of housing requirements, the provision of land for housing and the delivery of homes through the planning system: <http://www.scotland.gov.uk/Resource/Doc/233260/0063937.pdf>

<sup>37</sup> <http://www.ruralhousingscotland.org/about/index.htm>

<sup>38</sup> [www.sfha.co.uk](http://www.sfha.co.uk)

<sup>39</sup> See Dumfries and Galloway: <http://www.dgscht.co.uk/index.asp>; and Highland: [http://www.hscht.co.uk/old\\_site/index.html](http://www.hscht.co.uk/old_site/index.html)

<sup>40</sup> See also the Scottish Government's evaluation of Rural Housing Enablers: <http://www.scotland.gov.uk/Publications/2009/02/03141447/1>

<sup>41</sup> <http://www.highlandhousingalliance.com/site/>

<sup>42</sup> <http://www.energysavingtrust.org.uk/scotland/Scotland-Welcome-page/At-Home/Energy-Assistance-Package>

<sup>43</sup> [http://www.sgn.co.uk/index.aspx?rightColHeader=4&rightColContent=15&rightColFooter=237&id=198&TierSlider1\\_TSMMenuTargetID=198&TierSlider1\\_TSMMenuTargetType=1&TierSlider1\\_TSMMenuID=6](http://www.sgn.co.uk/index.aspx?rightColHeader=4&rightColContent=15&rightColFooter=237&id=198&TierSlider1_TSMMenuTargetID=198&TierSlider1_TSMMenuTargetType=1&TierSlider1_TSMMenuID=6)

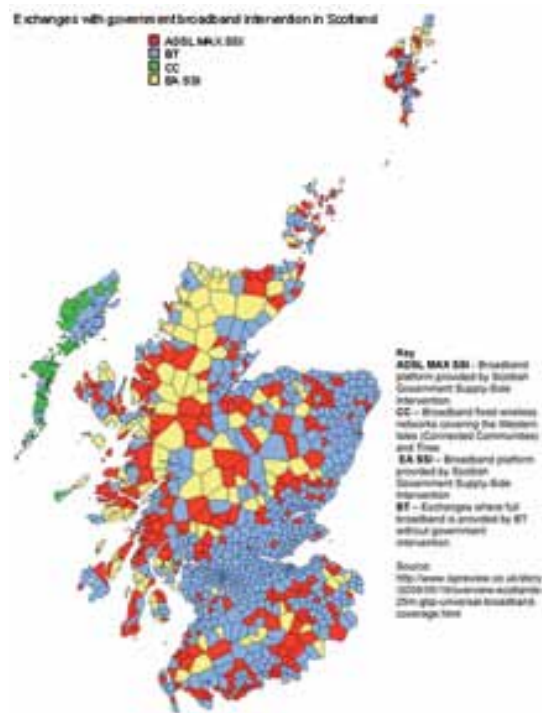
<sup>44</sup> <http://www.nationalgrid.com/uk/Gas/Ingstorage/Transporter/>

<sup>45</sup> Primrose, D. & Fawcett, J., 2007. Evaluation of the Scottish Executive's "Broadband for Scotland" intervention. Online: <http://www.scotland.gov.uk/Resource/Doc/212800/0056576.pdf>



In 2008 the Scottish Government signed an additional £3.3M contract to deliver affordable broadband to households and businesses that still could not access the technology – “Broadband Reach”. By May 2009 the main phase of the project was completed with around 2,100 installations<sup>46</sup>. It was announced in September 2009 that telephone exchanges in rural areas of Scotland would be upgraded, providing increased access to broadband<sup>47</sup>.

Figure 6. Broadband coverage in Scotland, May 2009



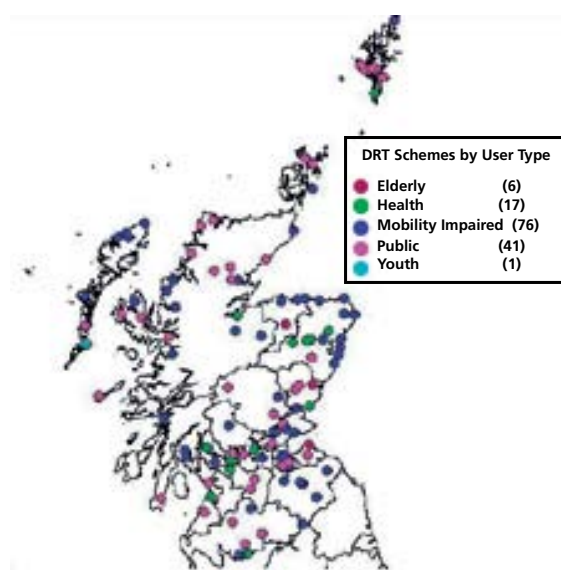
Looking to the future, Scotland’s rural communities will benefit from 2.9MEuro funding from the European Economic Recovery Package, funding new or enhanced broadband infrastructure provision<sup>48</sup>. There is ongoing investment in next-generation broadband services, such as those which will be delivered through BT’s £1.5 bn planned investment in fibre over the next 4-5 years, so far announced for 13 Scottish exchanges, and Virgin Media’s footprint which focuses on the Central Belt, Dundee and Aberdeen. It will be necessary to continue to assess the extent to which a digital urban-rural differential persists, and its socio-economic impact.

Complementary to these strategic public and private sector initiatives is a range of community broadband projects. **Community Broadband Network**<sup>49</sup> supports, promotes and develops community-owned broadband schemes throughout the UK. CBN was launched in 2004 and is a co-operative of community-run independent broadband operators. In Scotland, Angus Glens are looking at the possibilities of a community solution to bringing broadband to the Glens. Garvald and Morham Community Council runs a community broadband service in a remote part of East Lothian. The service took five years before it was up and running, with funding provided to the community council by the Leader+ programme. Connected Communities is a next generation broadband wireless network connecting businesses, teleworkers, schools, community centres, airports, post offices, remote learning centres, doctors, hospitals, and citizens across the populated islands of the Outer Hebrides of Scotland<sup>50</sup>.

### 3.3.4 Infrastructure: Communications networks - rural transport

In 1998 the **Rural Transport Fund (RTF)** was launched, aiming to improve transport links in rural Scotland. The RTF comprised three elements. The **Rural Public Passenger Transport Grant**, designed to enable local authorities to provide additional rural public transport services, and to allow the subsidising of non-commercial routes in rural areas. The **Rural Community Transport Initiative** funded community transport projects such as community minibuses<sup>51</sup>. The **Rural Petrol Stations Grant Scheme**<sup>52</sup> assisted rural petrol stations to meet the costs of tank replacement and groundwater protection requirements. Following the formalising of the Single Outcome Agreements (SOAs) between Scottish Government and local authorities in 2007, such ring-fenced funds ceased to exist in most areas. It is now for councils to decide how they will best allocate their funding according to local priorities.

Figure 7. DRT schemes by user type



**Demand Responsive Transport (DRT)** is any form of transport where day to day service provision is influenced by the demands of users<sup>53</sup>. DRT can therefore involve: taxis; community car schemes; non-emergency patient transport; dial-a-ride, community buses, and many other related services. All of these markets have grown in recent years but the high care needs market dominates DRT provision (Figure 7). It has been argued that expansion of DRT is essential for improving accessibility in Scotland. The largest numbers of DRT schemes (by local authority) are in Highland, Aberdeenshire and Argyll and Bute<sup>54</sup>.

<sup>46</sup> <http://www.scotland.gov.uk/Topics/People/BroadbandforScotland/SEBroadbandInitiatives/LatestNewsAnnouncements>

<sup>47</sup> <http://www.scotland.gov.uk/Topics/People/BroadbandforScotland/SEBroadbandInitiatives/Announcements>

<sup>48</sup> Response by Richard Lochhead to Parliamentary Question by Iain Smith; November 19<sup>th</sup> 2009.

<sup>49</sup> <http://www.broadband-uk.coop/>

<sup>50</sup> <http://www.connectedcommunities.co.uk/>

<sup>51</sup> Community Transport Association; see: <http://www.scotland.gov.uk/Topics/Transport/Road/RCTI/CommunityTransportAssoc> and [www.ctauk.org](http://www.ctauk.org)

<sup>52</sup> Two examples of which are still in existence, one in Highlands and Islands (HIE) area and one in Scottish Enterprise (SE) area.

<sup>53</sup> Derek Halden Consultancy, the TAS Partnership and the University of Aberdeen, 2006. Review of demand responsive transport in Scotland. Scottish Executive Social Research.

<sup>54</sup> [www.scotland.gov.uk/Publications/2008/09/26153659/14](http://www.scotland.gov.uk/Publications/2008/09/26153659/14)

The high cost of ferry fares has been seen by many as a barrier to economic growth on Scottish islands. Since October 2008, the Scottish Government has been running a pilot scheme that subsidises fares on ferry services in the Western Isles, known as **Road Equivalent Tariff (RET)** and runs until spring 2011. The routes for the pilot study are: Ullapool to Stornoway, Uig to Tarbert (Harris)/Lochmaddy (North Uist), Oban to Castlebay (Barra), and Lochboisdale (South Uist) and Oban to Coll and Tiree<sup>55</sup>. Early data on customer numbers on the RET routes suggest that the initiative has attracted 23% more cars and 14% more passengers compared to the same period in 2007-2008<sup>56</sup>.



### Highlands and Islands Air Services (Scotland) Act

**1980** makes subsidies available to fund certain “lifeline” air services in the Highlands and Islands, specifically airlinks between Tiree and Barra and Campbeltown and Glasgow. The subsidy ensures that these isolated communities have air links with the mainland. Without subsidy, air services to these communities would be uneconomical<sup>57</sup>. Further, the **Air Discount Scheme (ADS)** aims to tackle the problem of high air fares for the remotest communities in the Highlands and Islands by providing a discount of 40% on the core air fare on eligible routes<sup>58</sup>. The ADS is available to all “eligible persons” who live in Western Isles, Orkney Isles, Shetland Isles, Islay and Jura, Caithness or North-west Sutherland.

### 3.3.5 Service provision – health services<sup>59</sup>

A range of solutions has been put forward to address the challenges of providing health care in remote and rural Scotland. For example, the **Rural General Hospital (RGH)** concept; rural-specific generalist training; managed clinical networks for rural consultants; and improved communications technology<sup>60</sup> and innovative use of community buildings.

The RGHs of Shetland, Orkney, Stornoway, Fort William, Oban and Elgin have similar problems in maintaining consultant-led services in the face of increasing specialisation and the European Working Time Directive. The lesson from Australia is that RGHs can be used as a valuable educational resource in a health system as they promote the concept of generalism. The educational opportunities go beyond technical procedures and allow the observation of a whole system of health care for an individual patient. In managed clinical networks, local general surgeons work with specialists, and skill retention is ensured by joint operating sessions between the rural generalist and the specialist.

Communications technology has an increasing role to play in the delivery of health services in remote areas. Tele-care is the remote delivery of services to people in their own home by means of telecommunications and computerised systems<sup>61</sup>. In addition, tele-health services are an increasingly important part of service delivery in rural hospitals. For example, tele-radiology and tele-histopathology can facilitate case management between a local RGH and a super-specialist unit (likely to be located in an urban centre). Other applications of technology include screening for emergency conditions in rural populations, such as aortic aneurysm, which has been shown to save lives. Another example is that of paramedic pre-hospital thrombolysis supported by tele-links to coronary care, which reduces the time between the emergency call and treatment. These developments obviously need to be linked with maintenance and improvement in high-speed broadband infrastructure for them to be effective.



### 3.3.6 Service provision – multi-service outlets

Multi-service outlets are seen as one possible way of rural service providers ensuring sustainable provision, by co-locating a range of different services on one site, or running from one building<sup>62</sup>.

<sup>55</sup> <http://www.scotland.gov.uk/Topics/Transport/ferries-ports-canals/14342/TARIFF>

<sup>56</sup> <http://www.scotland.gov.uk/News/Releases/2009/08/03153517>

<sup>57</sup> <http://www.scotland.gov.uk/Topics/Transport/19675/highlands-islands/about-service>

<sup>58</sup> <http://www.airdiscountscheme.com/airds/4.html>

<sup>59</sup> See discussion in Section 1 of Report.

<sup>60</sup> <http://www.rcpe.ac.uk/publications/rarm/douglas.pdf>

<sup>61</sup> Joint Improvement Team, 2008. *Telecare in Scotland: Benchmarking the Present, Embracing the Future*. JIT

<sup>62</sup> SEERAD (2006), *Costs and Benefits of Co-locating Services in Rural Scotland*, (SAC/392/04) Final Report to The Scottish Executive by The Scottish Agricultural College (Dominic Moran, Clare Hall & Alistair McVittie).



In light of **Healthier Scotland** commitments, it has been suggested that there could be increased use of rural community facilities (such as village halls) for primary health services or GPs, as well as regular fitness classes. Given the Scottish Government's 2008 report "Delivering for Remote and Rural Health" and 2007 Action Plan "Better Health, Better Care", there may be scope for innovative ways of providing greater access to health services through these buildings<sup>63</sup>.

Successful co-location of services in the Outer Hebrides, as an example, include: (i) Third Sector Hebrides (formerly Voluntary Action Lewis) office space and drop-in premises in Stornoway; (ii) East Camp Trust community groups who have bought a disused RAF base (2.75 hectares) in Benbecula, Western Isles. Currently there is on site a community riding school, community care organisations working with different service users, a volunteer centre, befriending project and Council for Voluntary Service. The Trust aims to have a mix of social enterprise, as well as traditional voluntary and community activity. (iii) Uig Community Shop<sup>64</sup> had been established as a shop 25 years ago, and was formed as a community enterprise in order to ensure the ongoing provision of this service into the future. The shop is now part of the Co-Op and has, through successful management and applications for funds including to Big Lottery and the Plunkett Foundation's "The Store is the Core" and The Carnegie UK Trust, has been able to establish and maintain a multi-service store, which incorporates a petrol station, laundrette and Post Office, with an all-important space for local people to socialise and swap news.

### 3.3.7 Local Authority provision

Local Authorities across rural Scotland remain vital players in the provision of rural services (see below). Service provision-related activities are not only being carried out in relation to the two main National Outcomes (10 and 15) relating to service access, quality and responsiveness to local need. Rather, they are delivering to a range of Outcomes, including those relating to: employability and training, health inequalities, vulnerable adults and children, alcohol and drugs, integrated transport, ferry services, wider infrastructure for freight, affordable housing, social enterprise for service delivery, mobile provision, sport and active leisure and community policing. Specific initiatives highlighted in the 2008-2009 Progress Reports<sup>65</sup> include: Integrated transport across and between island groupings; Increased supply of affordable housing; commissioned study to determine baseline of social enterprise sector in context of public service delivery; mobile facilities, including mobile library and mobile home care for the elderly; development of local service indicators for settlements, i.e. what should be expected; welcome packs for EU and international workers in several languages; an "Access to Rural Areas Action Plan" to enhance access to services and amenities; and "People on the fringe" – targeting the harder to reach.

## 3.4 Conclusion: What is the future for Scotland's rural infrastructure and services?

The concluding section outlines a number of priorities for building on the infrastructure and service achievements already delivered across rural Scotland by a range of agencies including local authorities, the voluntary sector (see Section 4), private enterprise, and central government. We look firstly at specific components, then key points which apply across all infrastructure and services.

### 3.4.1 Debates needed around specific aspects

**Affordable housing and fuel poverty:** There is a need to understand how housing demand and supply is likely to change in the foreseeable future due to population structure, migration and mobility (Section 1). There is a need to consider what impact climate change (see Section 5) may have on energy demand and supply, patterns of extreme fuel poverty, reduced emissions and increased efficiency – all in a context of potential rising fuel costs in the medium term. Associated with this, we need to consider the range of renewables and sustainable development initiatives<sup>66</sup>, distinguishing between national and local initiatives such as district heating systems. What are the potential options, and how can interventions best support these? Is the priority, in addressing rural fuel poverty, the linking of people to the gas grid<sup>67</sup>, or putting in place more SINs, and linking this with more fuel-efficient new-builds directly targeted at those in extreme fuel poverty across rural Scotland? How does private (car) transport and demand responsive transport fit into targets for a low carbon rural Scotland (Section 5)?

**Private sector and rental market:** The role of the private sector in housing provision (both owned and rented) requires further investigation, and is likely to be the subject of a specific *In Focus Brief*, in order to explore this important component and its variability of provision across rural Scotland. Further, the role and importance of rented accommodation for rural Scotland needs investigation, as does, for example, the impact of the **Rural Homes to Rent** pilot scheme<sup>68</sup>, and the recently announced (January 2010) new powers for Local Authorities in which councils will have greater use of private rented housing for people made unintentionally homeless<sup>69</sup>.

<sup>63</sup> Skerratt, S., MacLeod, M., Hall, C., Duncan, R., Strachan, M. & Harris, J., Moseley, M. & Farmer, J., (2008), *Community facilities in rural Scotland: A study of their use, provision and condition*. Scottish Government Social Research.

<sup>64</sup> <http://www.whfp.com/Frontpage/Uig-community-shop-a-shining-example-for-others-to-follow.html>

<sup>65</sup> A random sample of seven rural Local Authority 2008-2009 Single Outcome Agreement Progress Reports were examined.

<sup>66</sup> See, for example, the Scottish Government's Scottish Sustainable Communities Initiative (SSCI): <http://www.scotland.gov.uk/Topics/Built-Environment/AandP/Projects/SSCI>

<sup>67</sup> Scottish Government (2008) Report, *Achieving our potential: A framework to tackle poverty and income inequality in Scotland*, p.16, <http://www.scotland.gov.uk/Resource/Doc/246055/0069426.pdf>

<sup>68</sup> <http://www.scotland.gov.uk/Topics/Built-Environment/Housing/investment/ruralhomesforrent>

<sup>69</sup> [http://www.publicservantscotland.co.uk/news\\_story.asp?id=11793](http://www.publicservantscotland.co.uk/news_story.asp?id=11793); 11th January 2010.



**Broadband communication – a two-tier system?** It is important to continue to investigate whether it is appropriate that rural areas, particularly those far from centres of population, will not have access to high-speed or next generation broadband, or efficient and cost-effective mobile technologies. Much has already been achieved, and assessments must be made of whether there are, in fact, insurmountable infrastructural issues, or conversely, if it is simply a matter of time until such ubiquity of affordable, reliable access is realisable.

**Rural services – health:** Trends in the population (see Section 1) point to demographic patterns such as mid-term increases of elderly in rural Scotland, and continuing migration patterns of elderly to more accessible rural areas. Key questions include: How are Scotland's rural health services planning their response to these challenges? How are/can digital technologies increasingly provide services, such as diagnostics and access to specialists, from a distance, and when is this appropriate<sup>70</sup>? Are there quality standards in provision that are rural-specific, and what processes already exist for identifying rural need and expectations<sup>71 72</sup>.

### 3.4.2 Debates needed around aspects which underpin all infrastructure and services challenges in rural Scotland

**Ongoing citizen engagement and inclusion:** The opportunities afforded by more local and regional channels, such as Community Planning Partnerships within the SOAs, LEADER Local Action Groups (under the SRDP), Rural Priorities (also SRDP) and the nascent Scotland National Rural Network<sup>73</sup>, are all suited in different degrees to the incorporation of rural citizen's views into rural service design<sup>74</sup>. These views include expectations of provision standards (see Section 4 regarding rural health). Further, local place-based initiatives such as community broadband and multi-service outlets incorporating Post Offices, are evidence of how individual and community energy can lead to locally-sustainable solutions through community buy-outs, co-operatives and social enterprises. Of course, there are ongoing challenges concerning the interest, capacity for management, and inclusiveness of such community processes, which need to be continually addressed (see Section 4 for discussion of these). There are also specific challenges in accessible and inclusive rural service provision for migrants within rural Scotland, as illustrated in the following example:

## In Focus: Providing services to culturally diverse rural populations

**Philomena de Lima, Director UHI Centre for Remote and Rural Studies**

Encouraging migration/immigration and its potential to address labour supply and skills shortages and gaps in rural areas has received growing policy attention. These trends also raise questions about the experiences of these diverse ethnic groups in accessing services in rural areas.

The experience of minority ethnic households in rural areas is affected by their size (generally small numbers), diversity (culturally, economically and socially) and dispersion, as well as an emphasis on economies of scale in service provision and the need for public investment and support for initiatives addressing discrimination.

Research on migrants and minority ethnic households suggests a number of recurrent issues which need to be addressed: lack of knowledge and information about services and how to access these; poor access to culturally sensitive services; language and communication barriers, including variable access to translation and interpretation facilities; prevalence of stereotypes and required knowledge and skills amongst provider agencies of how best to address the needs of diverse and dispersed minority groups.

Next steps could therefore include<sup>75</sup>: (i) increased commitment among rural service providers to respond to cultural diversity; (ii) inclusive consultation processes which take into account language and other issues; (iii) commitment to explore the potential of using information communication technologies to deliver services such as interpretation and English language provision; and (iv) investment in training for front line staff delivering services.

**Open debate over tensions and desirable/undesirable outcomes:** There needs to be continued debate, coupled with impact assessments, over the conundrums inherent within improvements to rural service provision; for example:

- Improving roads infrastructure, including bridges and causeways between islands, can give individuals greater mobility, which in turn can and does lead to the closure of local facilities; similarly, road improvements (e.g. to the A9) can lead to environmental concerns;

<sup>70</sup> See Berry, S. (2006), *Rethinking the future for rural service delivery*. <http://www.ruralfuturesconference.org/2006/Berry.pdf>

<sup>71</sup> See Section 4 for an In Focus example.

<sup>72</sup> Smith, M. & Homer, T., (2009), *A Review of Service Development and Innovation in the Delivery of Joint Health and Social Care and Support Services in Rural and Remote Areas Main Report*. NHS.

<sup>73</sup> <http://www.ruralgateway.org.uk/>

<sup>74</sup> See Section 1.4. on rural health service design by and for communities

<sup>75</sup> Two examples are: Angus Local Authority has produced a Welcome Pack for EU and international workers, in several languages, with specific information on accessing services; Perth and Kinross Local Authority assesses need related to the number of migrant workers accessing services.

- Enhancing broadband access in remoter areas can lead to a reduction in use of local facilities, where they exist. However, there is also increased “traffic” for those goods ordered online, thus generating business for delivery services such as the Post Office;
- Clustering and centralising (for example through regional centres) to enable specialist services to be maintained, perhaps leading to loss of remoter services;
- The targeted use of mobile services (including information and outreach for certain medical conditions or behavioural change) can make public the conditions or issues which would remain private to an individual in a larger community.

An evidence-based debate would be particularly fruitful if it were to take place in a cross-Directorate, cross-sectoral, cross-agency, way, such that the varied interests and perspectives could be tabled, local expectations could be identified and debated, and workable cross-linkages could be identified.

**Strategic practice:** Firstly, infrastructure in rural Scotland underpins services, as well as people’s mobility, business opportunities, social connectivity and thus their well-being. These multi-faceted implications mean, in turn, that rural infrastructure, far from being “neutral” or “inert”, is linked to the many different aspects of what it is to be rural in Scotland – from remoter islands through to accessible areas around commuter towns. This then means that infrastructure reaches across divisional and sectoral boundaries, since its condition (and potential) affects most aspects of Scotland’s social, economic and environmental sustainability. Calling for a joined-up approach to infrastructure and services provision for rural Scotland therefore makes conceptual sense, and echoes calls for a territorial<sup>76</sup> or regionalised approach to investment and spending.

We are seeing something of this ethos in the Scottish Government’s National Performance Framework, where there are three specific service-related Outcomes which sit within the overall Purpose of the Government:

- We live in well-designed, sustainable places where we are able to access the amenities & services we need
- We have strong, resilient & supportive communities where people take responsibility for their own actions & how they affect others
- Our public services are high quality, continually improving, efficient & responsive to local people’s needs

This “joined-up” approach across Government Directorates, and across Scotland through the Single Outcome Agreements of the 32 Scottish Local Authorities, presents an unprecedented opportunity for strategic perspectives and investment to take priority over shorter-term spending and targets. In the April 2009 Review<sup>77</sup>, there is evidence of “localisation of SOAs” such that, through the increased involvement of Community Planning Partnerships, localisation maximises relevance, fit and buy-in to local needs and priorities. It will therefore be important to examine, as the second phase of SOAs develops, the extent to which the “golden thread” of the SOAs do in fact enable joined up mechanisms to address the Outcomes, or whether regionally-specific needs<sup>78</sup> and priorities causes a necessary disjointedness rather than complementarity.



<sup>76</sup> OECD (2006), *New Rural Paradigm*, Paris: OECD.

<sup>77</sup> COSLA, SOLACE & IS (2009), *Interim Report from Local Government on the 1<sup>st</sup> Phase Single Outcome Agreements in 2008-2009*. <http://www.improvementservice.org.uk/library/download-document/2304-interim-report-from-local-government-on-the-first-phase-single-outcome-agreements-2008-2009/>

<sup>78</sup> For example, the Scottish Government (2008) Report, *Achieving our potential: A framework to tackle poverty and income inequality in Scotland*, states that: “This new flexibility for local partners and the move away from ring-fenced funding provides greater opportunities for local partnerships to develop policies and approaches which work in the local circumstances. For instance, the experience of poverty in rural areas differs in important ways to those in urban areas, and the services and responses put in place to deal with them must also differ” (p.4). <http://www.scotland.gov.uk/Resource/Doc/246055/0069426.pdf>

# 4. How are Scotland's rural communities taking ownership of their own future?

Sarah Skerratt

## Key points:

- 1. Bottom-up development:** Evidence shows that participation and engagement by rural communities is positive for rural development, giving better "fit" and enhanced sustainability. However, counter-arguments state that such processes can be elitist, parochial and over-risky.
- 2. On the ground:** Community-level participation projects have been taking place in many forms for decades across rural Scotland, through voluntary activity, social enterprises, community ownership and/or management of assets, participatory service design and business planning. There is little *systematic* evidence about the impacts for rural Scotland as a whole, since much is local level, individual and distinct. This hampers understanding.
- 3. Extending the timeframe:** Where the focus is on development projects, a 'project treadmill' may persist resulting in continuing dependency. Investment in the legacy of capacity over time - in institutions and communities - will give stronger more resilient communities.
- 4. Policy-related opportunities:** A range of policies and mechanisms exist which encourage engagement by Scotland's rural communities, such as community asset purchase and/or management, LEADER, Community Planning Partnerships, Single Outcome Agreements and the Scottish Community Empowerment Action Plan. Their success depends on capacity within institutions as well as within communities.
- 5. Declining public spending in 2010-2011:** will either constrain these opportunities, or conversely may lead to more local-led delivery. There is a strong need to gather evidence on the impacts of different routes for rural community resilience.

## 4.1 The case for community participation in rural development

The dominant view in place-based development is that participation is a "good thing", since it empowers communities through ownership of ideas<sup>1</sup>, problems and solutions. The capacity of individuals and communities to engage in such processes is seen as a vital piece of the jigsaw, and much is written around building such capacity – that is, harnessing and developing the skills and knowledge-base of local communities, and thus raising confidence and credibility in the development dialogues with agencies, and local and national governments.

This capacity is linked with "social capital" - networks and associated leverage these bring – which may be "bonding" (within the community) and "bridging" (from the community outwards into other communities or networks), and much has been written on the necessary balance between bridging and bonding that enables communities to be outward looking and yet cohesive, rather than parochial and isolated. Social capital is one of a number of capitals which are felt to exist within communities, as illustrated in the following table<sup>2</sup>:

**Table 1. Seven Community Capitals**

| Capital   | Definition   |
|-----------|--|
| Financial | Financial capital plays an important role in the economy, enabling other types of capital to be owned or traded  |
| Built     | Fixed assets which facilitate the livelihood or well-being of the community  |
| Social    | Features of social organisation such as networks, norms of trust that facilitate co-operation for mutual benefit, includes a sub-set of spiritual capital (that form of social capital that links to religion/spirituality). Bonding, bridging social capital. |
| Human     | People's health, knowledge, skills and motivation. Enhancing human capital can be achieved through education and training.   |
| Natural   | Landscape and any stock or flow of energy and material that produces goods and services. Resources – renewable and non-renewable materials.  |
| Cultural  | Shaping how we see the world, what we take for granted and what we value.  |
| Political | The ability of a community to influence the distribution and use of resources.   |

<sup>1</sup> See findings from LEADER+ Evaluation, where projects with more grass-roots links had "a higher degree of ownership and desire within the community for the project to succeed"; p.4. in Hecla (2006), *Evaluation of socio-economic outputs LEADER+ natural heritage projects*. Scottish Natural Heritage Commissioned Report No. 173 (ROAME No. FO4NC22) [http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/Report%20No173.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/Report%20No173.pdf)

<sup>2</sup> Butler Flora, C., Emery, M., Fey, S. and Bregendhal, C. (n.d.), *Community Capitals: A Tool for Evaluating Strategic Interventions and Projects*, Iowa State University, North Central Regional Center for Rural Development. <http://oklahoma4h.okstate.edu/edu/docs/7-capitalshandout.pdf>



Community-based capitals as assets is the basis of “asset-based community development” (ABCD)<sup>3</sup> <sup>4</sup> which is a rejection of the needs-driven approach (deficiency-oriented policies and programmes) where a community has to demonstrate its poverty before receiving help. ABCD proposes an approach where a community can develop “asset maps” which lead to mobilisation of assets by that community rather than relying on a paternalistic external system<sup>5</sup>. In much asset-based development, focus is typically on physical assets, but the 7 Capital framework (above) gives equal weight to the socio-cultural capitals.

## 4.2 Reservations and concerns about bottom-up, place-based development

Although the majority of commentators believe that community engagement in development leads to greater “buy-in”, improved “fit” and increased longevity of on-the-ground initiatives, there are some who sound a note of caution against seeing these approaches as a panacea for all rural community developmental needs and priorities. These cautionary notes are now briefly outlined.

Firstly, when considering the capacity for change at community level, the dominant assumptions are that, firstly, there is always willingness and desire by communities to take responsibility; and secondly, that dispersed rural communities have the appropriate make-up of skills and capacities to tackle the requirements of community management or ownership, particularly post-acquisition of an asset such as a building. However, there is anecdotal and research evidence<sup>6</sup> that these two assumptions are not always well-placed (see below).

Secondly some authors have highlighted concerns that community participation favours the articulate, well-networked and vocal, those with high human and social capital, and thus although such processes can appear democratic they may in fact be reinforcing existing exclusive patterns at local level. Some authors therefore discuss the need for inbuilt safeguards to ensure accountability<sup>7</sup> since although devolving to the local communities may appear “democratic”, it may actually foster elitist or exclusive development processes and outcomes.

Thirdly, in a number of cases of community-first approaches, there is the presupposition that local perspectives are always “right” and “outside” perspectives inevitably “wrong”. This builds on the assumption of perfect sight (both spatially and in terms of futures) at local level, and does not acknowledge parochialism, competition between communities for limited funds, and partial perspectives, however well articulated. This then leads to questions over how, in practice, does the development process incorporate views from diverse positions and levels, and how does it lead to accommodation of these views<sup>8</sup>.

Fourthly, there is concern by some charities and voluntary sector organisations, as well as communities and individuals, that local, place-based approaches which rely primarily on volunteering can run the risk of making less clear people’s “entitlements” to services<sup>9</sup>, instead allowing only the development of community solutions. There are concerns that some providers view community-based solutions as being cheaper than central or regional provisions, and, particularly in a time of constrained budgets, they might appear more attractive. Those who have these concerns argue that care needs to be taken not to erode basic entitlements, particularly to services.

Finally, and the least well-researched, is the fact that there is little systematic understanding of “institutional readiness”. That is, into how institutional capacity is being addressed such that institutions can “absorb” the views, wishes and plans of “enabled communities”. The primary focus of capacity-building is the communities on the ground; however, institutional communities at the various levels of policy formulation, analysis and implementation also need to increase their capacity for engagement and change<sup>10</sup>.

### 4.2.1 Ownership of assets by the community?

As in the previous sub-section, there is still strong debate amongst a range of academics and long-established charities and practitioners around whether ownership, or at least management/leasing, of physical assets is an essential component of self-determination by communities in place-based community development.

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<sup>3</sup> See Kretzmann and McKnight (1993): <http://www.abcdinstitute.org/> More recent work has also been carried out extensively by the Coady International Institute, Nova Scotia Canada (particularly Mathie and Cunningham, 2003 and 2005). It also feeds into the relatively new field of appreciative inquiry Elliott, C. (1999), *Locating the Energy for Change: An Introduction to Appreciative Inquiry*, Winnipeg, Canada: International Institute for Sustainable Development; and relates to the Sustainable Livelihoods approach ( [www.livelihoods.org](http://www.livelihoods.org) )

<sup>4</sup> See also O’Leary et al (2006), *Asset Based Approaches to Rural Community Development: literature review and resources*, Published by the Carnegie UK Trust: <http://rural.carnegieuktrust.org.uk/files/rural/Asset%20Based%20Approches%20-%20IACD.pdf>

<sup>5</sup> The Carnegie UK Trust (2009) has identified parameters in determining the value of assets; see pp.14-15 (link at Footnote 25).

<sup>6</sup> See, for example: (i) Shucksmith, M., (2000) “Endogenous development, social capital and social inclusion: perspectives from LEADER in the UK”, *Sociologia Ruralis* 40 (No. 2), 208–219. (ii) Shortall, S., (2004), “Social or economic goals, civic inclusion or exclusion? An analysis of rural development theory and practice”, *Sociologia Ruralis* 44 (No. 1), 110–124. (iii) Skerratt, S. et al (2008), *Community facilities in rural Scotland: a study of their use, provision and condition*. Edinburgh: Social Research, Scottish Government.

<sup>7</sup> Shortall, S. (2008), “Are rural development programmes socially inclusive? Social inclusion, civic engagement, participation, and social capital: Exploring the differences”, *Journal of Rural Studies* 24 (2008) 450–457.

<sup>8</sup> For extensive discussions on these aspects, see: Cooke, B. and Kothari, U. (eds) (2001), *Participation: The New Tyranny?* London: Zed Books; Hickey S. and Mohan, G. (2004), *Participation: from Tyranny to Transformation? Exploring new approaches to participation in development*. London: Zed Books.

<sup>9</sup> See, for example, the Carnegie UK Trust’s comment on this issue in their *Charter for Rural Communities* (2007), p.47: [http://rural.carnegieuktrust.org.uk/publications/a\\_charter\\_for\\_rural\\_communities-the\\_final\\_report\\_of\\_the\\_carnegie\\_commission\\_for\\_rural\\_community\\_development](http://rural.carnegieuktrust.org.uk/publications/a_charter_for_rural_communities-the_final_report_of_the_carnegie_commission_for_rural_community_development)

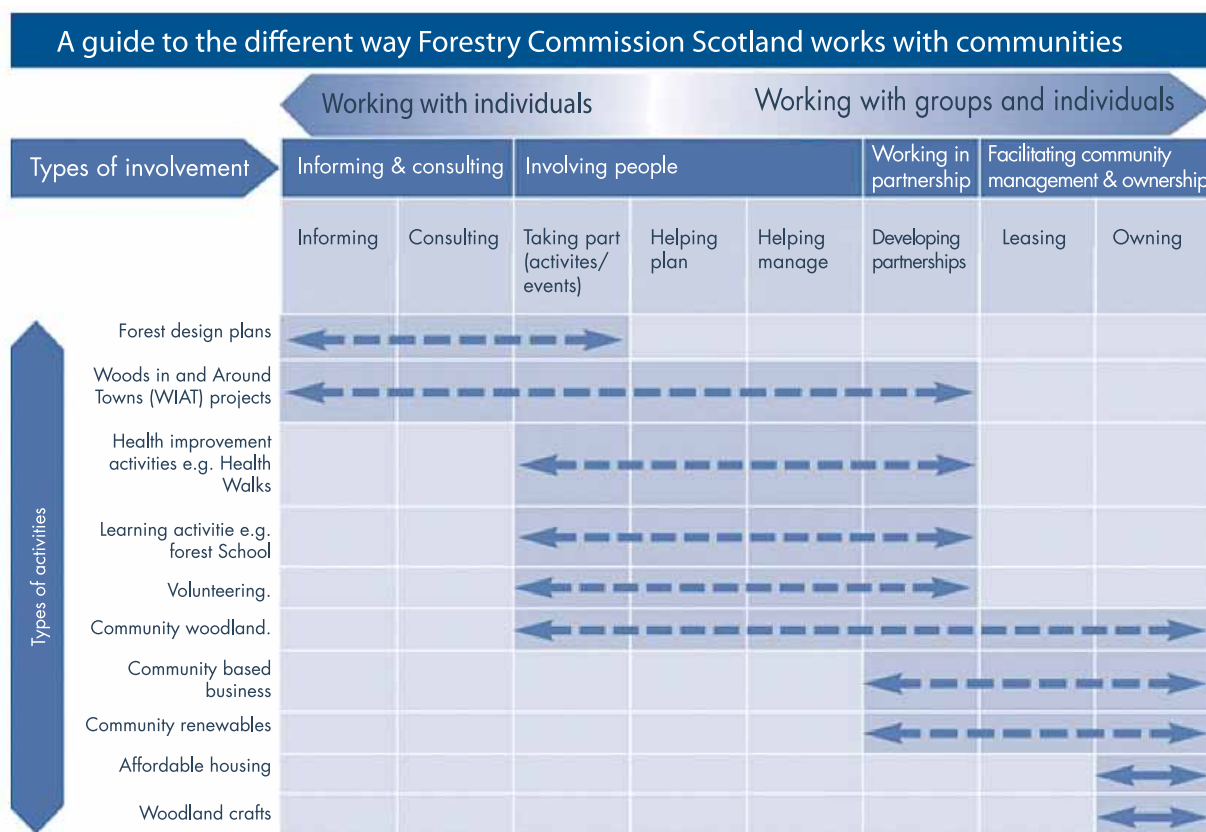
<sup>10</sup> OECD (2009), *Rural Policy Review, Scotland, UK*; Paris: OECD; p. 21.

In 2003, Scotland saw the introduction of the Land Reform (Scotland) Act, Part 2 of which provides opportunities for communities to apply to register an interest in buying land and buildings. Once such an interest is approved by Scottish Ministers, it is entered on the Register of Community Interests in Land<sup>11</sup>. Registration provides the community with a right to buy if the owner decides to sell. The advantages<sup>12</sup> of the Community Right to Buy (CRtB) were identified in the legislation as<sup>13</sup>: (i) greatly empower communities; (ii) effect rapid change in pattern of land ownership<sup>14</sup>. Later in this section, we see the outcomes of one of these opportunities.

Two additional schemes in Scotland are very important in this regard. Firstly, the Scottish Land Fund (SLF) (2001-2006)<sup>15</sup>, which aimed to support local communities in buying and developing rural land, and the Growing Community Assets (GCA) (2006-2010)<sup>16</sup>, which aimed to expand SLF and give communities more control and influence over their development through ownership of a variety of assets. Under the SLF, 239 grants were awarded, a total of £13.9M was disbursed, 74% of which were in the HIE area. In September 2009, GCA's budget of £50M had £18.2M still to be allocated, with 91 grants having been awarded, 74% in rural areas. The GCA first year baseline report<sup>17</sup> (by SQW Consultants) raises an issue of pertinence to this Section; that is, whether the ownership of an asset is crucial to achieving its outcomes, or whether there are alternative approaches that can lead to the same outcomes.

Similarly, Forestry Commission Scotland (FCS) has developed its community engagement role<sup>18</sup>, and, rather than focusing only on asset ownership, has identified a spectrum, knowing that each community will need to be involved in different ways.

**Figure 1. Menu of community engagement options (reproduced by permission of Forestry Commission Scotland).**



Source: Menu of community engagement options (reproduced by permission of Forestry Commission Scotland).

South of the Border, ownership of assets (buildings and land) by communities was the focus of the 2007 Quirk Review<sup>19</sup> and is one of the rare occasions where the **risks** of asset ownership by communities are highlighted as being important to address; these include:

<sup>11</sup> [www.rcil.ros.gov.uk/RCIL](http://www.rcil.ros.gov.uk/RCIL)

<sup>12</sup> See Caledonia Centre for Social Development 2-years-on analysis where Wightman mentions these two objectives of the Act, and discusses whether they have been met: <http://www.andywightman.com/briefings/>

<sup>13</sup> See also Holyrood debate from 2006: <https://voteforscotland.snp.org/node/9116>

<sup>14</sup> Highlands and Islands Enterprise is proposing a CRtB seminar in 2010, which will aim to identify opportunities to improve the CRtB legislation, promote the potential benefits of CRtB, and build capacity in communities.

<sup>15</sup> SLF was launched on 26 February 2001 by the New Opportunities Fund, a National Lottery distributor. Highlands and Islands Enterprise administered the Scottish Land Fund on behalf of the New Opportunities Fund.

<sup>16</sup> GCA was funded through the Big Lottery Fund (BIG), administered by the Scotland Committee and delivered by a Highlands and Islands Enterprise (HIE)-led consortium of national partners. GCA was one of four investment strands in the Big Lottery Fund's *Investing in Communities* programme which ran until 31 March 2009.

<sup>17</sup> SQW Consulting (2009), *Evaluation of Growing Community Assets: First year baseline report*. [http://www.biglotteryfund.org.uk/gca\\_yr1\\_030609.pdf](http://www.biglotteryfund.org.uk/gca_yr1_030609.pdf)

<sup>18</sup> <http://www.forestry.gov.uk/forestry/INFD-7Q4J6R>

<sup>19</sup> <http://www.communities.gov.uk/documents/communities/pdf/321083.pdf>

1. Organisation does not have the capacity to take over and manage<sup>20</sup> the asset
2. Asset not used in public interest, taken over by an unrepresentative or unaccountable minority, access to asset not inclusive
3. Community organisation is not able to invest in the asset to meet its longer term liabilities for upgrading and cyclical maintenance
4. Reliance of smaller receiving organisations on volunteers through lack of resources for professional/support staff
5. Confusion and lack of awareness over roles, responsibilities and liabilities between the landlord and the community organisation
6. Conflict between competing community organisations for use of, ownership or management of asset

Capacity for the ongoing management of assets was investigated in an analysis of rural community facilities (RCFs) in Scotland, being seen as one of the key components of their ongoing sustainability as hubs of rural communities<sup>21</sup>. The survey found that 80% of surveyed RCFs are owned by the community and less than 20% by local authorities.

Further:

*“Less than one fifth of respondent committees had prepared a business plan in the past five years and two-thirds had no budget preparation year-on-year. Almost one third of respondents reported that their facility has a budget deficit. Virtually no committees had received training in business planning, management or governance in the past year; less than one-fifth had been to workshops, conferences or networking events. This finding supports a general perception amongst those involved in RCFs and stakeholders that the longer term sustainability of many facilities presents a considerable challenge and raises the issue of where there may be unidentified or unmet needs for capacity-building, especially given the increased pressure for strategic business planning from potential funders.”*



Some commentators<sup>22</sup> argue, therefore, that there is a parallel need for development in provision of technical and other professional advice to support such communities.

#### 4.2.2 Resilience of rural communities in Scotland

Although the debate continues as to the most appropriate and sustainable ways to engage communities in their own rural futures, the actual capacity of rural communities to adapt is seen as being a vital component of their *resilience*: “a developable capability to rebound or bounce back”<sup>23</sup>.

A rural community resilience toolkit has been developed<sup>24</sup>, which has identified eleven concepts or indicators of rural community resilience which appear to enhance “psychological wellness” in that community: Social networks and support; Positive outlook; Learning; Early experience; Environment and lifestyle; Infrastructure and support services; Sense of purpose; Diverse and innovative economy; Embracing differences; Beliefs; and Leadership.

Over the same period, the Carnegie UK Trust published its *Charter for Rural Communities* (2007) and in its *Manifesto for Rural Communities* (2009)<sup>25</sup> identified three “enabling factors that form the prerequisites for vibrant rural communities: (i) Growing the capacity of local people, agencies and professionals; building strong social networks founded on high levels of volunteering and skilled support; (ii) Enhancing community assets of all kinds; and (iii) Effective community-led planning and stronger local governance. They worked with the Skills Consortium<sup>26</sup> “to determine the core skills, knowledge and competencies required by rural activists, professionals and policy makers and, thinking ahead, the requirements for communities who face an uncertain future” (p.4) and developed **The Carnegie Skills and Knowledge Bank**.

#### 4.3 What evidence do we have of communities determining their own rural futures in Scotland?

In rural Scotland, there is a wealth of evidence of community-led projects and programmes, some of which have been totally “home grown” and others which have been developed through partnership arrangements with different institutions and through national or regional Government-led schemes and projects. In this section, rather than presenting a compendium of projects, we highlight some examples whilst focusing on the key lessons to emerge from these. Firstly, we look briefly at the role of the voluntary sector in Scotland’s rural development.

<sup>20</sup> The HECLA (2006) evaluation of LEADER+ projects found that the level of management expertise was a “significant key element” in determining success of projects” (p.3).

<sup>21</sup> <http://www.scotland.gov.uk/Publications/2009/01/05144855/17>

<sup>22</sup> Such as the Carnegie UK Trust Manifesto (2009); see footnote 25.

<sup>23</sup> Luthans, F. & Youssef, C.M. (2007), “Emerging Positive Organizational Behavior”, *Journal of Management*, Vol. 33, No. 3, 321-349

<sup>24</sup> Hegney, D., Ross, H. Baker, P., Rogers-Clark, C., King, C., Buikstra, E., Watson-Luke, A., McLachlan, K. and Stallard, L. (2008), *Building Resilience in Rural Communities, A Toolkit*. The University of Queensland and the University of Southern Queensland. <http://learningforsustainability.net/pubs/BuildingResilienceinRuralCommunitiesToolkit.pdf>

<sup>25</sup> [http://rural.carnegieuktrust.org.uk/publications/a\\_manifesto\\_for\\_rural\\_communities\\_-\\_inspiring\\_community\\_innovation](http://rural.carnegieuktrust.org.uk/publications/a_manifesto_for_rural_communities_-_inspiring_community_innovation)

<sup>26</sup> [http://rural.carnegieuktrust.org.uk/rarp/rural\\_community\\_development\\_skills](http://rural.carnegieuktrust.org.uk/rarp/rural_community_development_skills)



### 4.3.1 The role and significance of the voluntary sector

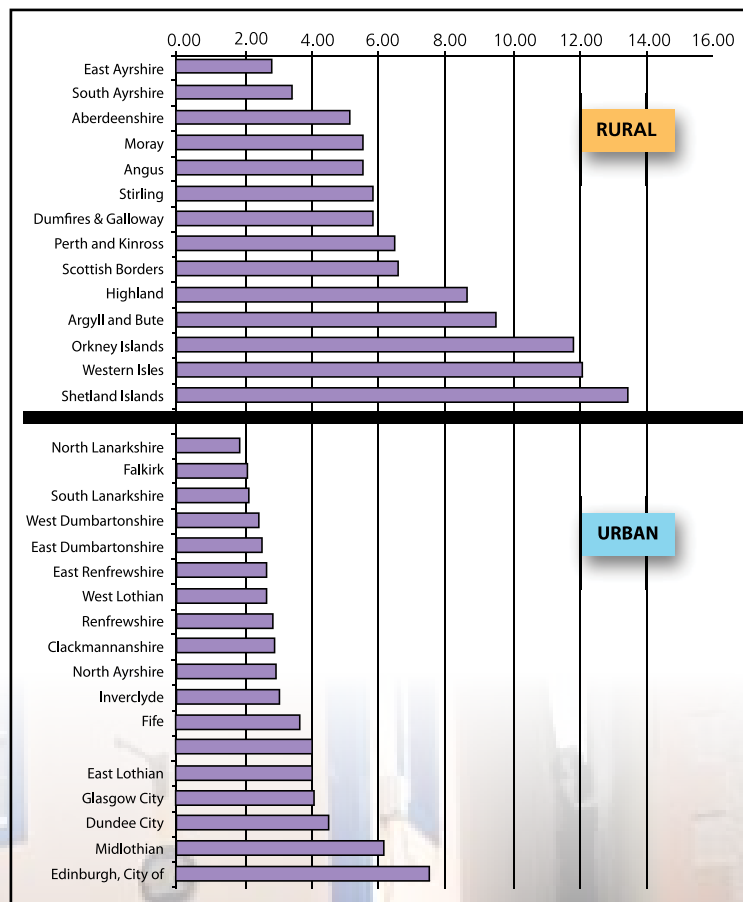
The rural voluntary sector accounts for over 40% of the regulated voluntary sector<sup>27</sup>. The largest proportion in a single rural local authority area is the Highlands, which contributes almost 9% of all regulated organisations. Figure 2<sup>28</sup> shows the rural-urban distribution of regulated voluntary sector organisations per 1000 people. SCVO states that<sup>27</sup>:

“The high concentration of rural voluntary organisations may be a function of distance, where more organisations are needed for a fewer number of people in order to provide adequate access. Correspondingly, the disproportionately higher organisation count in the Highlands is most probably due to the especially large geographic area covered by this local authority”. They further state that “the true scale of voluntary activity in rural areas may be underestimated as the figures do not take into account the possibility that rural areas may hold a larger number of branches and a smaller set of separately constituted organisations than non-rural areas”.

In rural Scotland more people give up their time to help as a volunteer or organiser than in the rest of Scotland<sup>29</sup>. 47% of people in remote rural areas<sup>30</sup> and 38% in accessible rural areas have given up time in the past 12 months to help as an organiser/volunteer, compared to 29% in the rest of Scotland<sup>31</sup>. Their efforts feed into support of the Strategic Outcomes of Scottish Government<sup>32</sup>.

In a recent study of Scotland’s Rural Community Facilities (RCFs)<sup>33</sup>, or village halls, the central importance of voluntary input in managing such facilities was evident. Of the 322 RCFs we surveyed, 68% were managed by a voluntary association, and almost 18% as Trusts; 80% were registered charities. The average size of RCF committees was approximately nine people. Across the 322 RCFs for which survey data are available, this suggests almost three thousand individuals are involved. In addition to members of the RCF committee, there are staff employed to run/manage the building and additional volunteers.

**Figure 2. Number of charities per thousand of the population**



<sup>27</sup> Scottish Council for Voluntary Organisations: <http://www.scvo.org/scvo/Information/ViewInformation.aspx?al=t&page=&all=&from=DSR&Info=176&TCD=34&PageName=The%20Rural%20Dimension>

<sup>28</sup> Scottish Council for Voluntary Organisations, (pers. comm.) based on 2008 OSCR data and 2007 GRO population estimates

<sup>29</sup> These findings are reflected in HELCA (2006), where the evaluation of LEADER+ Projects found that the majority of projects (almost 80%) were underpinned by voluntary activity, and 71% reported that unpaid voluntary work had contributed to the completion of the projects, and were assisted by between 1 and 10 volunteers (Source: Footnote 1, p. 22 & p.29).

<sup>30</sup> See *National Planning Framework for Scotland*, Rural Scotland, point 177: <http://www.scotland.gov.uk/Publications/2004/04/19170/35348>

<sup>31</sup> Source: *Rural Scotland Key Facts* (2009), based on Scottish Household Survey 2008 (Using Scottish Government Urban Rural Classification, 2007-2008)

<sup>32</sup> <http://www.scotland.gov.uk/Resource/Doc/288502/0088238.pdf>

<sup>33</sup> Skerratt, S., MacLeod, M., Hall, C., Duncan, R., Strachan, M. & Harris, J., Moseley, M. & Farmer, J., (2008), *Community facilities in rural Scotland: A study of their use, provision and condition*. Scottish Government Social Research.

# In Focus: The role of the voluntary sector in Scotland's rural development

**Norman MacAskill, Head of Rural Policy, SCVO**

Rural Scotland has more volunteers and voluntary organisations per head of population than its urban neighbours and the work of the voluntary sector, in all its guises, is essential to the sustainability and resilience of rural communities.

Without this work, in many rural areas there would simply be no community life – no village halls, no sports and leisure clubs, no ceilidhs or concerts, no playgroups or lunch clubs, no galas or games days, no environmental groups, community woodlands or community energy projects.

Activities like these will never turn an easy profit, and could not be run economically or effectively by the public sector but they are at the heart of rural community life. And services like social and health care for rural citizens are increasingly delivered by voluntary organisations – some small and local, some national charities - working in partnership with national and local government, who recognise that the voluntary sector offers value for money, flexibility and strong connections with the client group in their communities.

Without the voluntary sector many linkages between public policy and rural communities through lobbying, advocacy and campaigning, would vanish. Participation in Community Planning Partnerships is increasing, and the recent 2009 Sutherland Summit is one example of voluntary organisations taking the lead in creating a strategic vision for local development.

The work of the voluntary sector is not an optional add-on to rural community life - it is at its very heart. Sustainable and resilient communities need economic success, but without the often undervalued work that supports the life of those communities, they could not and would not survive.

## 4.3.2 Examples of increasing community confidence through community ownership and management

Although there is still debate around whether communities should always own their assets, there is evidence that engagement with one's own rural area – through learning more about possible options, through engaging in decisions, through management of local resources or through ownership – can lead to a “virtuous circle” of increased understanding, confidence and further building of social and human capital. This then increases the chance for communities to maintain themselves and to adapt – that is, to be resilient. One such example is that of the North Harris Trust<sup>34</sup>, and here, the Chief Executive of the Trust, Calum John Mackay, outlines what he believes to be the outcomes that can be attributed to the process of forming the Trust and of the land purchase.



## In Focus: North Harris Estate

**Calum John Mackay, Chair, North Harris Trust**

When the North Harris Estate was placed on the market by the Bulmer family (of Cider fame) in 2002, the community of North Harris expressed an interest in acquiring the estate and running it for the benefit of the local community. The estate consisted of 63,000 acres of land, a large castle, approx 1,000 red deer, salmon and trout fishing on a number of lochs, a number of dwelling houses and various other buildings. A feasibility study was conducted and it was considered that maintaining the castle and operating it as a business would not be a feasible option. So, the option of splitting the estate was actively pursued and a separate purchaser for the castle was sought. In due course, a business man was identified who was prepared to purchase the castle, the salmon & trout fishing and a number of other properties. The community would purchase the remaining assets: the land, the deer and a few of the properties.

Initially, there was a mixture of enthusiasm and justifiable caution within the local community. In particular, older people who were accustomed to the former regime found it difficult to accept a situation where a sporting estate would be run by local people; the very people who had previously been denied direct access to it. While previous owners had not been outwardly antagonistic to local people, they had not actively engaged in community development. This was about to change!

The main changes we have seen include greater inward investment in community projects, the creation of additional jobs, the provision of direct financial support to local businesses. People have a sense of ‘ownership’ of their own community and a desire to support what is being done. In general, there appears to be greater confidence within the community and people have a great sense of pride in the community and the environment. The developments outlined have happened because the Trust has provided local people with greater opportunities for involvement and because it has highlighted many unforeseen opportunities.

<sup>34</sup> See: North Harris Trust, see: <http://www.north-harris.org/>  
See also the West Harris Trust: <http://www.scotland.gov.uk/News/Releases/2010/01/25110007>

### 4.3.3. Addressing challenges of rural services provision through engagement and management processes

**Remote Service Futures:**<sup>35</sup> brings together community members and public service providers to design locally-specific health and related services for remote communities. RSF is about *anticipatory service design*, and is aimed primarily at fragile communities - those that have small populations, are dependent upon a small group of workers to provide local services and are relatively distant from service centres:

## In Focus: Remote Service Futures

Jane Farmer and Amy Nimegeer

The initiative was sparked by studies of communities at loggerheads with service providers over suggestions for service change; for example, replacing a GP with a nurse practitioner. In protest situations, communities and service providers apply valuable energy to destructive situations rather than building services by uniting participants to design good services together and driving a constructive dialogue.

Here's the process: **step 1:** get the participants together, develop process ownership; **step 2:** the community identifies its health assets and challenges; **step 3:** service providers visit the community, introducing ideas from other communities; **step 4:** the community health and social care budget is shared and the community decides how it would spend this. In a Highland community where the district nurse will retire imminently, residents and service providers have designed a new hybrid professional with paramedic and nursing competencies.

RSF worked with **four remote Scottish communities**, trialling methods of participation, reviewing ideas and finding and sharing information. These communities were selected because they were remote and assessed by NHS Highland to be experiencing service provider change or potentially to be experiencing change in the near future, mainly due to retirement of existing staff. Due to legislative and regulation changes, both service providers and community members tended to agree that it would be difficult to find replacement staff with similar skills and attitudes to extending their roles as current professionals. Simultaneously, over the years the demographic make-up of remote communities has changed (often, but not always, to include higher proportions of older people) and new types of health and social care roles have emerged. It is useful to have a mechanism to review whether the service mix to communities still represents an appropriate model.

Ultimately a process has emerged which has key components of engagement that is: as inclusive as possible, is quite highly informed, demands attitudes of construction and flexibility from participants, is time and resources efficient. Engagement worked best where participants (all participants – community members and service providers) attended the four meetings, took on board information and asked questions, were prepared to find ways of moving beyond basic barriers and entrenched positions, were prepared to understand the standpoint of others. Engagement worked less well where participants (all participants – community members and service providers) adopted entrenched positions, opted out, used regulations and entrenched practices as a barrier.

RSF can build enduring relationships between communities and service providers, leading to realistic and affordable service solutions. It builds a mutual knowledge base fostering capacity for future partnerships to build health. Rural community capacity is strained, service providers have ever tighter budgets. RSF builds and directs collective energy to produce locally-fit services.

**Atlantis Leisure:** Business management and succession planning are essential parts of the jigsaw that make up successful, longer-term community-led initiatives<sup>36</sup>. This is because change is planned for, rather than being responded to after-the-event. When identifying what makes rural communities resilient, the analyses point to planning, sharing duties and responsibilities within the community according to skills and assets, and harnessing people's social and human capital to best effect<sup>37</sup>. One example of an outstanding initiative in rural Scotland is Atlantis Leisure in Oban which took over the local swimming pool in 1992 from the Local Authority on a 21 year lease with the intent to develop indoor sports facilities:



<sup>35</sup> Funded through the Knowledge Transfer Partnership Scheme, as well as by UHI Millennium Institute, Highlands and Islands Enterprise and NHS Highland

<sup>36</sup> This point is highlighted in the Carnegie Manifesto for Rural Communities (see footnote 25, above).

<sup>37</sup> See Kenyon (no date), plus "Ten Characteristics of Sustainable Communities" (NSW Premier's Dept), [http://www.communitybuilders.nsw.gov.au/download/com\\_sustain.pdf](http://www.communitybuilders.nsw.gov.au/download/com_sustain.pdf); and "Characteristics of a Resilient Community" (Centre for Community Enterprise, Canada), <http://www.cedworks.com/communityresilience01.html>



## In Focus: Atlantis Leisure

**Hugh MacLean, former Director, Atlantis Leisure**

Communities have the capabilities to deliver exceptional levels of service and facilities. We have learned that **'if the problems are in the community, the solutions are in the community'**. However it is not enough to just want something to happen. Communities must galvanise themselves and make it happen using all the skills, drive, focus and bringing together the right people to provide leadership, direction, management skills along with desire to assist their community.

Over the past 18 years, the volunteer directors of Atlantis Leisure have built a centre with 6 court hall, dance studio, gym, play areas, outdoor pitches and provision of a café. In total £3 million invested. Services provided, community programmes and partnerships with a wide range of community agencies are all continually developed. The centre has a turnover approaching £1 million/year but it is the impact on and in the community that is important. Increased community confidence with a can-do attitude produces new projects, more people active, increasing numbers of youngsters learning the benefits of active lifestyle and spin off community developments.

This has been done by taking a business approach to the whole project, having clear vision, addressing community wide need, recruiting people with skills as well as enthusiasm, augmenting skills from within the community as required and looking to the future whilst taking care of the day-to-day. Now with its third chairman Atlantis Leisure continues to ensure the assets, finance and people skills are kept in balance whilst continuing to grow and develop services required in the community. Thus this Social Enterprise is like any other business but has both a commercial and community focus to it.

### 4.4. What policy mechanisms exist which support these processes?

The need for community engagement, and the further building of capacity to enhance such participation – both within communities and institutions – is increasingly recognised within domestic and European policy. In this subsection, we describe current initiatives with relevance to rural Scotland which touch on issues that we have highlighted in this section.

#### 4.4.1. The LEADER Programme (1991 onwards)

LEADER is viewed as an approach rather than simply a programme. It began in 1991 promoted by the EU to “help rural actors improve the long-term potential of their local areas” and is “aimed at encouraging the implementation of integrated, high-quality and original strategies for sustainable development for local areas, drawn up and implemented by broad-based local partnerships, called Local Action Groups (LAGs).”

In 2006, LEADER became part of the Scotland Rural Development Programme (SRDP), with a six year budget of just under £60million and is delivered by 20 LAGs, membership of which is equally split between the public sector and rural business and community representatives. The following box describes how LEADER has been implemented in one area of rural Scotland, and the legacy and outcomes it can deliver:



## In Focus: LEADER in South Lanarkshire

**Chris Parkin, Lanark Rural Development Trust**

So why does LEADER make a difference? To answer this let me go back 10 years and explain the journey that I have been through with LEADER in South Lanarkshire. In our rural area there was no previous history of strong community engagement through a bottom-up approach to policy and project development. Through LEADER, momentum built that led to significant community achievements and strong public sector backing. LEADER acted as the catalyst to support rural regeneration and mobilised local resources, as individuals and communities acquired a better knowledge of the opportunities available and developed greater ownership and commitment to projects.

The integrated approach brought partner organisations together under a common rural agenda and created a common vision, set of goals and a common bond of trust. This has led to the development of new and innovative approaches to rural service delivery, including establishing resourced and sustainable community based delivery organisations that can take forward important local projects, and a structure for engaging with rural communities that includes one stop rural service delivery and bi annual conferences which attract around 150 interested individuals and representatives.

New funding has also been levered that is utilised alongside LEADER to achieve strategic objectives, such as windfarm community benefit monies. However, perhaps most importantly, a momentum of activity has been established that can keep rural issues high on the local economic development and enterprise agendas.

#### 4.4.2. Community Planning Partnerships (2003 onwards)

Community Planning was introduced as part of the Local Government in Scotland Act 2003, and “is a process which helps public agencies to work together with the community to plan and deliver better services which make a real difference to people’s lives”<sup>38</sup>. Community Planning Partnerships (CPPs) operate in all of Scotland’s 32 Local Authorities. Strategic roles for CPPs include: Setting out the vision and identifying local outcomes for the area in consultation with communities; responsibility for managing funding and commissioning work/services relating to outcomes where there is a significant collaborative element; governance over any service delivery arrangements put in place to support collaborative delivery; and holding each other to account for progress towards outcomes.

#### 4.4.3. Government Economic Strategy (2007)

In 2007, the Scottish Government introduced its Economic Strategy and enshrined within this is the Single Purpose: “To focus Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth”<sup>39</sup>. Underpinning this Purpose are the five Strategic Objectives of: Wealthier and Fairer, Smarter, Healthier, Safer and Stronger, and Greener. There are 15 National Outcomes related to these Objectives, the most relevant to this section of the Report being Outcome 11: “We have strong resilient and supportive communities where people take responsibility for their own actions and how they affect others”. Two other Outcomes relate to rural services (see Section 3 of this Report). Scottish Government states that: “Government cannot create strong, resilient and supportive communities on its own, but it can take the lead in creating the conditions in which these communities can develop and flourish”.<sup>40</sup>

#### 4.4.4. Single Outcome Agreements (2007)

2007 saw the formation of the Single Outcome Agreement<sup>41</sup> between central and local government, via a “historic concordat” which committed both national and local government to moving towards SOAs for all 32 of Scotland’s councils and extending these to Community Planning Partnerships (CPPs).

*“The Scottish Government and local government share an ambition to see Scotland’s public services working together with private and voluntary sector partners, to improve the quality of life and opportunities in life for people across Scotland. Single Outcome Agreements are an important part of this drive towards better outcomes. They are agreements between the Scottish Government and CPPs which set out how each will work in the future towards improving outcomes for the local people in a way that reflects local circumstances and priorities, within the context of the Government’s National Outcomes and Purpose.”*

According to the publications around the SOA, it is seen as a more “respectful” alliance between central and local government, and has been welcomed by COSLA and by the 32 local authorities. The SOAs were formally agreed on 16<sup>th</sup> June 2009.

#### 4.4.5. Scottish Community Empowerment Action Plan (2009)

This Plan<sup>42</sup> was launched jointly by the Scottish Government and the Convention of Scottish Local Authorities (COSLA). Of importance to this subsection on rural community engagement, community empowerment is defined as a “process where people work together to make change happen in their communities by having more power and influence over what matters to them”(p.8). Further, we read about “invigorating democracy”, which is achievable because:

*“Scotland’s communities are a rich source of talent and creative potential and the process of community empowerment helps to unlock that potential. It stimulates and harnesses the energy of local people to come up with creative and successful solutions to local challenges... This is about all of us recognising that communities doing things for themselves can sometimes be the best way of delivering change. This will require mature dialogue between the public sector and community groups, underpinned by trust and respect” (p.6).*

The Plan outlines different types of community empowerment and the importance of capacity-building to support it, which focuses on achieving: (i) confident, skilled, active and influential communities; (ii) effective and inclusive community organisations; and effective relationships between community organisations and other organisations and services. In addition to Community Planning Partnerships, community organisations are recognised as an integral component of community empowerment:

*“The formation, existence and development of, democratic, inclusive and competent community groups, is key to community empowerment. These groups ... are around for the long term and have strong ties into the wider community. They will take many forms: Development Trusts; community based housing associations; community councils; registered tenant organisations; community forums” (p. 14).*



<sup>38</sup> <http://www.scotland.gov.uk/Topics/Government/PublicServiceReform/community-planning>

<sup>39</sup> <http://www.scotland.gov.uk/About/scotPerforms/purposes>

<sup>40</sup> <http://www.scotland.gov.uk/About/scotPerforms/outcomes/communities>

<sup>41</sup> <http://www.scotland.gov.uk/Topics/Government/local-government/SOA>

<sup>42</sup> <http://www.scotland.gov.uk/Resource/Doc/264771/0079288.pdf>

The specific actions in the Plan are: (i) Highlight existing examples of community empowerment; (ii) Development and implementation of a model scheme of establishment for community councils and a code of conduct for community councillors; (iii) Support for communities to own assets; (iv) Support for local councillors to support community empowerment; (v) Training to support community empowerment and engagement; (vi) Investment to improve community capacity-building; (vii) Participatory budgeting pilot; and (viii) Community Empowerment Programme – Direct investment accessible by community groups.

## 4.5. Future directions and challenges for policy, practice and research

### 4.5.1 The case for, and reservations about, community participation

In this Section, the case for participatory approaches to rural development was outlined, as were the reservations and concerns relating to community-level development approaches. In order to increase our understanding, and to inform policy and practice more effectively, there is a need to gather robust evidence on the **benefits, dis-benefits and outcomes**, across a range of cases, of “devolved”, localised development in rural Scotland. This will entail the generation of meaningful indicators of change, which are able to capture the complexities of social and human capital, and the hard-to-assess components of “increased community confidence”, for example. This will give an evidential basis for discussions and policy formulation which in turn can be used to question and assess the most appropriate ways forward, rather than simply assuming an agreed direction of travel. The extensive lessons learned from, for example, the LEADER Programme and Community Planning Partnerships, provide an excellent foundation for such analysis.

### 4.5.2 Critical analysis of empowerment

Coupled with such an investigation, there is also the need to gather further evidence which allows for a critical (rather than romanticised or politicised) analysis of empowerment, participation and engagement as components of genuine, sustainable rural development practice in Scotland. These are complex and sensitive issues, and it is thus not a naïve exploration that we propose; rather one that can intelligently assess effects, impacts, outputs, and outcomes, through a well-honed framework of analysis.

### 4.5.3 Extending the timeframe

It is evident from a range of studies that building and maintenance of capacity takes time, and often needs to take place beyond political or project lifecycles. It requires investment rather than spending<sup>43</sup>, such that we move from the current system which has been described, in relation to rural policy design in Scotland, as one which:

*“does not truly engage local leaders and foster creativity and innovation but rather fosters a “subsidy mentality” where local actors adapt to top-down strategies to get resources even if that is not exactly what is needed in their territory”<sup>44</sup>.*

Spending primarily on projects, on short-term achievements, means that activities are more task-oriented, and relate solely to the lifecycle of the project. In contrast, planning for succession, for next stages, and investment in genuine building of capacity as a legacy – in communities and in institutions who work with communities – is a prerequisite for thriving rural communities.

### 4.5.4 Empowerment and resilience

In addressing these complex, multi-layered and often-emotive aspects, and their policy and practice implications, it will then be possible to assess the extent to which participation and engagement are actually enhancing the resilience of Scotland’s rural communities, and thereby contributing to Scotland as a whole.



<sup>43</sup> OECD (2006), *New Rural Paradigm*. Paris: OECD. [http://www.oecd.org/document/7/0,3343,en\\_2649\\_33735\\_37015431\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/7/0,3343,en_2649_33735_37015431_1_1_1_1,00.html)

<sup>44</sup> OECD (2008), *Rural Policy Review Scotland*, Paris: OECD. See <http://www.ruralgateway.org.uk/en/node/751> for Summary



# 5. What impact will climate change have on rural Scotland?

Anita Wreford

## Key points:

1. There are likely to be tensions between economic growth, food security and climate change policy. There is a need for strategic management beyond the immediate; there needs to be a coherent and cohesive view of activity across and between sectors, and a prioritisation of policy aims.
2. Some responses to climate change (e.g. developments in renewable energy, changes in production type, loss of certain species) may lead to significant changes in Scotland's rural areas. Understanding what changes are acceptable (and to whom), and what should be preserved, is vital.
3. Uncertainty is inherent with regard to climate change. At the same time, action needs to be taken now. There is a need to understand better what makes decisions robust under uncertainty.
4. There is significant potential for Scotland's rural sector to take advantage of projected changes. A better understanding of what is required in order to seize the opportunities and remove any barriers is important to avoid opportunities being missed.

## 5.1. Introduction

It is now widely accepted among the science community<sup>1</sup>, as well as more broadly amongst society as a whole, that the climate is changing due to human interference with the climate system. What this means globally will vary between regions and between socio-economic groups, and over time. However it is now very likely that the changes will be significant and will cause severe disruptions to many of our systems. In addition, our response to tackling climate change is likely to also require important changes to how we currently live, produce and consume food, and source our energy.

This Section begins by setting out the most recent projections of the climate impacts that are likely to affect Scotland over the next century. It then goes on to outline what the implications of these changes are likely to be for rural Scotland, and how rural Scotland can play a positive part of the climate change solution. The relationship between rural Scotland and climate change goes far beyond the immediate direct changes on climate, the national emissions targets, and adaptation options. There is no way to disentangle Scotland from the global community, and decisions that Scotland makes in tackling climate change have the potential to have global ramifications, and, perhaps more obviously, global decisions will profoundly affect Scotland. Part of what makes rural Scotland different from urban Scotland is the agriculture and land use sector, which faces distinct challenges and opportunities under a changing climate. This section will focus particularly on those aspects of climate change that are unique to the rural sector, leaving aside those issues which do not differ significantly between rural and urban areas.



<sup>1</sup> IPCC (2007) "Summary for Policymakers". In: Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.) *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

## 5.2. Projected changes in climate

The UK Climate Impacts Programme (UKCIP) has recently (June 2009) published an updated set of climate projections for the UK, developed by the Met Office Hadley Centre<sup>2</sup>. These projections represent the current science, and are probabilistic in nature, meaning that the likelihood of each scenario occurring can be assessed. The scenarios are presented for the 2020s, 2050s and 2080s, and by low, medium and high emissions scenarios (current evidence suggests we are on a high emissions scenario trajectory currently, unless practices change dramatically). The projections provide information to the regional level of East, West and Northern Scotland, against a baseline of 1961 – 1990 weather data. SCCIP, the Scottish Climate Change Impacts Partnership ([www.sccip.org.uk](http://www.sccip.org.uk)), provides support for Scotland in using these projections.

The projections indicate slight increases in temperature by the 2020s across all regions of Scotland of around 1 degree. There is little change in precipitation expected in the East, however there are already expected to be larger changes, particularly in winter precipitation in the North and West, under both low and high emissions scenarios (across all regions and scenarios the trend is for increases in winter precipitation and decreases in summer, although the range is quite large and can range from negative to positive).

By the 2050s the scenarios project larger increases in temperature across all regions, with the smallest change expected in the North. Larger changes in precipitation are projected, albeit with a large range as mentioned previously. The West of Scotland is expected to see the largest increase in winter precipitation, and all regions are projected to see a relatively large reduction in summer precipitation (around 13% in the East and West under a high emissions scenario).

The scenarios indicate potentially large increases in summer temperatures by the 2080s, with a mean increase of 4.3% in the East and West under a high emissions scenario, and 2.6% under a low emissions scenario (see figure 1). Winter temperatures are expected to increase by smaller amounts but still over 2 degrees even in the low emissions scenario. Large changes in precipitation are also expected, with the largest increases expected in the West, of up to 30% increase in winter precipitation and 20% decrease in summer precipitation under a high emissions scenario.

Figure 1 illustrates the central estimate for the projected change in annual mean temperature for Scotland in 2080, under a high emissions scenario. These generalised changes will result in diverse local impacts, depending on the specific conditions, the sensitivity of the system, and the ability to adapt.

### 5.2.1. What are the implications of these projected changes for Scotland?

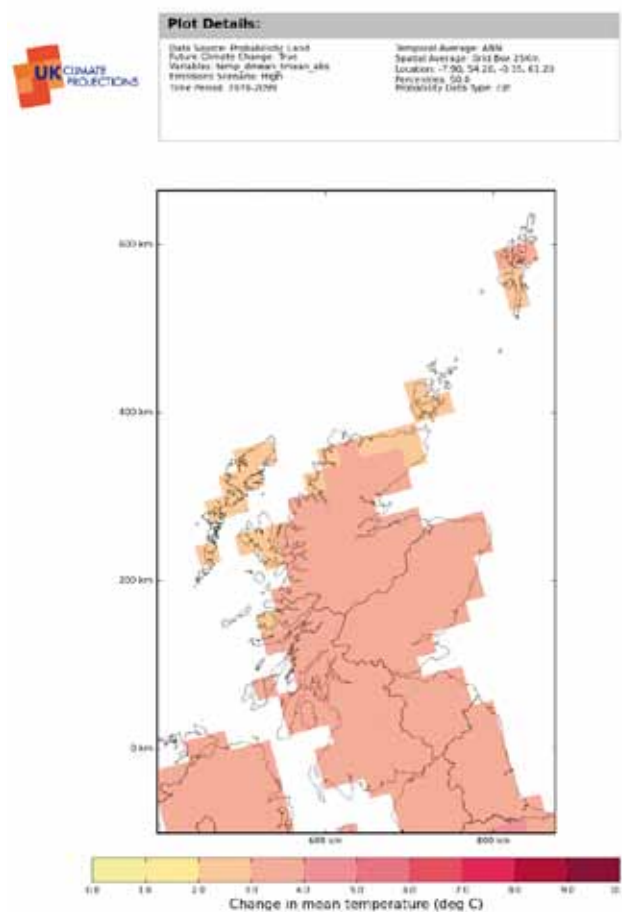
Some of these changes projected for Scotland are likely to have favourable impacts on the rural sector. These may include milder winters and a longer growing season, allowing positive changes to be made. However, others, particularly changes to rainfall timing have the potential to lead to extreme weather events, particularly flooding and drought.

The warming associated with climate change during historically cooler periods (i.e winter) is likely to reduce feed requirements, increase survival and lower energy costs for livestock<sup>3</sup>. However, warming in the warm periods of the year may result in heat stress, which can result in reductions in the fertility of livestock, and may also result in animal welfare issues<sup>4</sup>.

Research suggests that intensive grazing systems are likely to be quite sensitive to climate change, particularly through their sensitivity to water supply and drainage<sup>5</sup>. Extensive systems, which are more common in Scotland, are likely to respond more slowly to impacts, but the differences in response between species are likely to lead to a change in species composition. A more favourable climate in the uplands and a longer growing season in general may lead to an expansion of intensive grazing, with the associated increases in fertiliser application. This in turn suggests potential problems in terms of diffuse pollution to water and air.

In addition there is the potential for an increase in many livestock pest and disease problems due to less 'winter kill' and longer disease seasons as they can persist in the environment for greater proportions of the year.

**Figure 1. Central estimate for the projected change in annual mean temperature for Scotland in 2080, under a high emissions scenario**



Source: UKCP09 <http://ukclimateprojections.defra.gov.uk>

<sup>2</sup> Murphy, J., Sexton, D., Jenkins, G., Boorman, P., Booth, B., Brown, K., Clark, R., Collins, M., Harris, G., Kendon, L (2009) *Climate change projections*. Met Office Hadley Centre <http://ukclimateprojections.defra.gov.uk/content/view/full/824/517/>

<sup>3</sup> Maracchi, G.; Sirotenko, O.; Bindi, M., (2005), 'Impacts of present and future climate variability on agriculture and forestry in the temperate regions: Europe', *Climatic Change*, 70 (1-2), 117-135.

<sup>4</sup> Moran, D., Topp, K., Wall, E., Wreford, A., (2009), *Climate change impacts on the livestock sector*, Report for Defra.

<sup>5</sup> Muriel P., Downing T., Hulme M., Harrington R., Lawlor D., Wurr D., Atkinson C.J., Cockshull K. E., Taylor, D.R., Richards A.J., Parsons D.J., Hillerton J.E., Parry M.L., Jarvis S.C., Weatherhead K. and Jenkins, G. (2000) *Climate Change and Agriculture in the United Kingdom*. Brochure prepared for the UK Ministry of Agriculture, Fisheries and Food

Water resources are likely to be affected under a changing climate. Changes in the timing and magnitude of rainfall are likely to lead to water supply, quality and flooding problems. Flooding, both as a result of river flow, infrastructure failure, and coastal flooding, has the potential to impact water quality and increase erosion. Low rainfall in certain periods of the year may lead to restrictions on use. The Flood Risk Management (Scotland) Act 2009, as well as the EU's Water Framework Directive and the Water Environment and Water Services (Scotland) Act 2003 all have provisions for adapting to climate change.

The changes therefore are likely to result in mixed impacts, some positive and some negative. The challenge of successfully adapting to them is discussed further in this section.

### 5.2.2. Is there evidence for changes already occurring?

Globally, evidence of changes to our climate is already available. Average global temperature and sea-level rise have increased since the late 19th century, and at an increased rate in recent decades. In the UK, average temperatures have risen since the middle of the 20th Century. Central England temperatures have risen by about one degree since the 1970s, while temperatures in Scotland have risen by around 0.8 degrees since the 1980s<sup>6</sup>. Temperatures have increased in every season and in all parts of Scotland since 1961. This has been the fastest period of warming observed over the 1914 to 2004 period. Heavy rainfall events have increased significantly in winter, particularly in northern and western regions. In addition, the snow season has shortened across the country since 1961, with the season starting later and finishing earlier in the year. The greatest reductions have occurred in northern and western Scotland<sup>7</sup>.

See box 1 for a particularly Scottish example of climate changes that are already being seen. Other examples of a changing climate on Scotland's wildlife and biodiversity are highlighted in Sections 6, 7 and 8 of this Report.



#### **Global warming could pose a threat to a key ingredient used in one of Scotland's most famous dishes.**

Research in 2008 showed that global warming could pose a threat to a key ingredient used in one of Scotland's most famous dishes. SAC's Veterinary Investigation Centre highlighted an increase in lungworm infections in sheep, a parasite which renders sheep lung – used to make haggis – unfit for consumption. The analysis concluded that climate change could well be a factor in the rise of cases and could lead to lung being used less in making the food, rather being substituted by other ingredients.

[http://news.bbc.co.uk/1/hi/scotland/highlands\\_and\\_islands/7648481.stm](http://news.bbc.co.uk/1/hi/scotland/highlands_and_islands/7648481.stm)

### 5.3. How can rural Scotland be part of the climate change solution?

Because anthropogenic climate change is caused by an increase in what are known as greenhouse gases (GHGs) in the atmosphere, which trap solar radiation, the primary mechanism for minimising the rate and magnitude of warming is to reduce the concentration of GHGs in the atmosphere. This is referred to as mitigation, and can involve reducing emissions of GHGs directly, as well as increasing activities which absorb emissions (carbon sequestration), or store carbon, such as in soils. Carbon dioxide (CO<sub>2</sub>) is the main GHG, however methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) are also important GHGs and particularly relevant to the agricultural sector. Under the Climate Change (Scotland) Act of 2009, the rural land use sector is one of the sectors required to report on its programmes and policies to reduce emissions and its progress each year in reducing emissions. In addition, the land use sector is required to produce a land use strategy under the Act, where it must outline the Government's objectives in relation to sustainable land use, as well as proposals, policies and their associated timescales for meeting those, by March 2011.



Currently the agricultural sector contributes 7.69% of Scotland's total emissions (see Figure 2), while the Land Use, Land Use Change and Forestry (LULUCF) sector provides a sink of emissions of 4.44%.

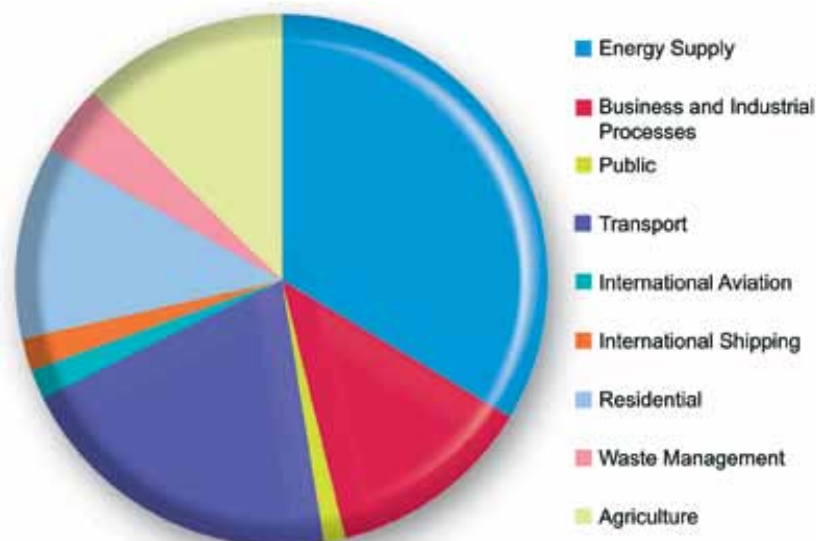
<sup>6</sup> UKCIP Trends

<sup>7</sup> SNIFFER (2006). *A handbook of Climate Trends Across Scotland*



### 5.3.1. Scottish greenhouse gas emissions by sector, 2007

Figure 2. Scottish greenhouse gas emissions by sector, 2007



The rural sector in Scotland is in a promising position to play an important positive role in tackling climate change. Through its extensive peatlands, uplands and forests, Scotland has the potential to be a valuable store of carbon, as well as being a leader in reducing emissions cost-effectively from agricultural and horticultural practices. By thinking proactively and setting in place foresighted frameworks to ensure effective adaptation takes place, Scotland could be in a position to take advantage of possible climatic changes. These opportunities come with the responsibility of balancing existing priorities including carbon storage, food production, biodiversity conservation and water quality.

Source: Scottish Greenhouse Gas Emissions 2007 (2009) Official Statistics Publication for Scotland

### 5.3.2. Carbon Storage

Scotland currently stores a large volume of carbon in its upland and peat soils<sup>8</sup>. In addition it aims to increase its carbon sequestration through increased plantation forestry. These are valuable carbon stores, however it is vital that a coherent overview of activity across and between sectors and the life cycle of products is maintained as these stores have the potential to become sinks under several conditions. Carbon stored in soils is released through cultivation, and under a changing climate there is likely to be increasing pressure on currently uncultivated land to be brought under cultivation, through a combination of an increase in favourable growing conditions, increased attractiveness due to higher market prices for certain crops resulting from changing climate conditions elsewhere and a growing demand for food. In the longer term, research suggests that soil can become a source of carbon under higher temperatures, so if mitigation efforts fail and high rates of warming are experienced, soil may begin to release its stores of carbon.



Scotland has a strategy to increase forest coverage to around 25 percent of land<sup>9</sup>, which has the potential to sequester significant volumes of carbon. However increasing the forested area in order to sequester carbon may lead to carbon being released from soils, therefore a full analysis of the base situation must be made. Furthermore, forested land may face similar pressures to upland and peat soils as other crops become more profitable and compete for land<sup>10</sup>. The final use of timber is also important to consider as this will determine whether carbon remains in the wood or is released into the atmosphere. At a larger scale, there is some evidence to suggest that changes in land cover, such as large areas of afforestation can result in greater rates of warming through altering the area's energy balance, as well as changing the albedo of the earth<sup>11</sup>.

In summary, Scotland currently stores a large volume of carbon in its soils and forests. This is an important resource and care must be taken to preserve it to avoid it switching from being a sink to becoming a source of carbon.

<sup>8</sup> *The Scottish Soil Framework* (2009), The Scottish Government, Edinburgh <http://www.scotland.gov.uk/Resource/Doc/273170/0081576.pdf>

<sup>9</sup> Scottish Forestry Strategy 2006 [http://www.forestry.gov.uk/pdf/SFS2006fcdc101.pdf/\\$FILE/SFS2006fcdc101.pdf](http://www.forestry.gov.uk/pdf/SFS2006fcdc101.pdf/$FILE/SFS2006fcdc101.pdf)

<sup>10</sup> Glück, P., Raynor, J., Berghäll, O., Braatz, S., Robledo, C., Wreford, A., (2009), "Governance and policies for adaptation" in Seppälä, R., Buck, A., Katila, P. (eds), *Adaptation of forests and people to climate change – A global assessment report*. IUFRO World Series Volume 22. Helsinki.

<sup>11</sup> Denman, K.L., G. Brasseur, A. Chidthaisong, P. Ciais, P.M. Cox, R.E. Dickinson, D. Hauglustaine, C. Heinze, E. Holland, D. Jacob, U. Lohmann, S. Ramachandran, P.L. da Silva Dias, S.C. Wofsy and X. Zhang, (2007): "Couplings Between Changes in the Climate System and Biogeochemistry." In: Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

### 5.3.3. Renewable energy

A key element to reducing GHG emissions is to ensure that electricity production comes from non-polluting sources. This is where Scotland is also in a very strong position to take advantage of some of the natural resources available. The Scottish Government has set a target of



50% of the demand for Scottish electricity to be supplied from renewable sources by 2020, with an interim milestone of 31% by 2011. Scotland's historic hydro resource plus new onshore wind developments have currently provided the main source of renewable energy, but it is expected that deep water offshore wind, wave power, tidal stream and biomass will make an increasing contribution in future.<sup>12</sup>

Some of these developments have implications for Scotland's rural areas as they generally require large amounts of land (with the obvious exception of the offshore options). While these developments, including those offshore, may provide opportunities in terms of generating employment, and contributing to the rural economy (see Section 2) there may be tensions between land use and local communities' wishes. There is however great potential for making positive and innovative use of Scotland's natural resources. Box 2 describes a project for making Scottish national parks carbon neutral.

## In Focus: Carbon Neutral National Parks in Scotland?

**Professor Bill Slee**

The Scottish conception of a national park is distinctive. The National Park Authority is not so much the implementing agency but a mentor and guide to the actions of the multiple stakeholders who live in and use the parks. In this spirit, the Cairngorms National Park has taken a strong interest in renewable energy. It has brought together stakeholders, promoted knowledge transfer events, engaged in partnership activity and sponsored research.

The Government target of reducing greenhouse gas emissions by 80% by 2050 is a formidable challenge. It will almost certainly require behaviour change as well as technical change. It will almost certainly need a mixture of 'sticks' such as carbon taxes and 'carrots' such as grants for renewables installations.

The parks contain the key assets used in renewable energy in plenty: wood, water and wind. However, the exploitation of such resources needs highly sensitive management in a national park setting. Large-scale intrusive developments are clearly unacceptable. The land-based sector can and is already contributing to renewables energy. One Speyside estate is delivering woodchip in a successful attempt to relocalise heat energy production. A Donside farmer has introduced new hydro-power technology to a disused small-scale hydro plant. There are many opportunities to extend woodland cover in ways that will sequester carbon.

Other developments such as green tourism initiatives and attempts to rebuild local food markets can also contribute to the wider vision of carbon reduction. However, the major challenge that remains is household consumption of energy; not just that which is used in the park, but also that which is embodied in the products consumed in the park. Carbon neutrality is some way off, but it is a laudable goal and sets the issue of confronting climate change centre stage.

### 5.3.4. Reducing emissions from the agriculture, land use, land use change and forestry sectors

While offering significant potential for storing carbon, the agricultural sector is also a source of emissions, predominantly through methane as a by-product of animal digestion; the use of nitrogen in agricultural soils leading to nitrous oxide emissions; and through agricultural manures and their management, producing both methane and nitrous oxide. The rural sector as a whole contributes to emissions like every other sector of society, through housing, transport, energy use etc. These sources of emissions that are not unique to the rural sector will not be discussed further here, although there is an issue relating to transport in remote and rural areas and the lack of public transport facilities (see section 3).



In order to play its part towards minimising the worst impacts of climate change through emissions reductions, Scotland has recently developed the Climate Change (Scotland) Act. This commits Scotland to ambitious emissions reductions targets, of 80% by 2050 and an interim target of 42% by 2020.

<sup>12</sup> The Scottish Government Renewables Action Plan <http://www.scotland.gov.uk/Publications/2009/07/06095830/0>

The rural sector is expected to contribute to meeting these targets. As yet commitments in the agriculture, land use, and land use change and forestry sectors (ALULUCF) are expected to be met through voluntary action, however it is feasible that in the future regulations could also be introduced. The Scottish Government's Climate Change Delivery Plan sets out the high level measures required in each sector to meet Scotland's statutory climate change targets, to 2020 and in the long term<sup>13</sup>, although this will soon be superseded by the more detailed report on programmes and policies. Rural communities, households and industry in rural areas will also be required to reduce emissions, primarily through a reduction in energy use, improving energy efficiency in buildings, and in the transport sector. Emissions from ALULUCF are of the greatest concern with regard to the rural sector, because of the potential trade-offs between production and emission reduction. On the other hand there are also excellent opportunities for improving efficiency, reducing costs, and minimising other environmental impacts at the same time.

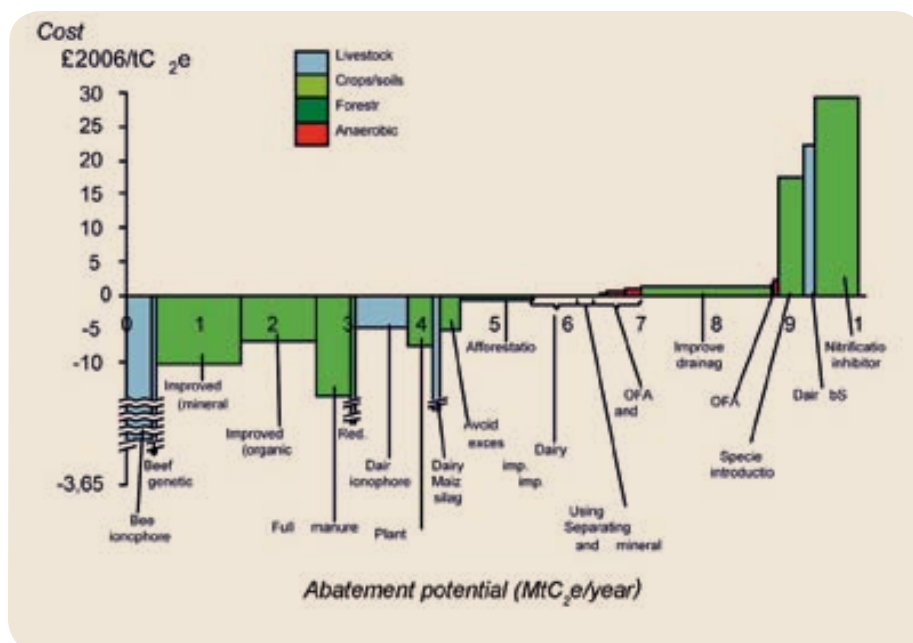
The Scottish Government has introduced a strategy entitled Farming for a better Climate<sup>14</sup> which focuses on five action areas to help farmers in Scotland tackle climate change and improve their business. These five areas are: using energy and fuels efficiently; developing renewable energy; locking carbon into soil and vegetation; optimising the application of fertilisers and manures; and optimising livestock management and storage of waste.

A range of options for reducing agricultural emissions do exist, although it is worth noting that some emissions from agriculture are unavoidable. Given the importance of the sector in producing food, and the increasing emphasis being placed on food security, it is important to focus on those emissions that represent inefficiencies in the system and will provide win-win opportunities for the producers, and/or other environmental benefits, such as reduced pollution or improvements in animal welfare.

A technique for identifying the cost-effectiveness of mitigation measures is through the development of marginal abatement cost curves (MACCs). These curves show a hierarchy of measures showing mitigation costs (in this case GBP per million tonnes of CO<sub>2</sub>-equivalent) and effectiveness (volume of gas), illustrating which measures deliver the cheapest to the most expensive savings of CO<sub>2</sub>. Development of the marginal abatement cost schedules is data-demanding in terms of screening the range of crop, soil and livestock mitigation methods and their associated adoption costs.

Assuming a policy environment that allows or promotes the adoption of mitigation measures, recent UK analysis suggests that by 2012, agriculture, land use, land use change and forestry (ALULUCF) could be mitigating around 6% of current greenhouse gas emissions. By 2022 this rises to nearer 25%<sup>15</sup>. An example of a stylised MACC for ALULUCF is shown in figure 3, which illustrates that some measures would actually provide a negative cost to producers, i.e. a benefit (those below the x-axis). The wider the band is, the greater volume of gas is mitigated. Further along the axis, measures go above the x-axis, indicating a cost to producers, but still significant benefits in terms of emissions reduction. At the far end of the curve, measures are very expensive and do not realise significant reductions. This type of exercise is based on many assumptions so is useful as an indication of potential options, however the reality will be different across time and space.

Figure 3. Marginal Abatement Cost Curves for ALULUCF<sup>15</sup> for 2022



Notwithstanding the commitment to reduce emissions under national and international regulations, there is an increasing demand in some markets for food produced with minimum environmental impact. Showing that Scottish agriculture has a low carbon footprint is likely to make it more attractive and possibly attract a premium.

There may be tensions between other policy and social priorities however. Increases in rural population growth (see Section 1), the underlying goal of increased economic growth (Section 2), and the associated infrastructure and networks required to support these may lead to an increase in emissions. Ideally, all economic development and other new projects (such as housing) would consider their carbon impact and use the most eco-friendly products and standards. At a strategic level, it is important that climate change goals are integrated throughout all policy areas to avoid conflicting incentives and unintended consequences.

More broadly and in common with urban business and industries, there is likely to be the potential for rural industry to pursue opportunities for reducing carbon emissions while simultaneously increasing economic growth. As mentioned in the introduction, this section focuses on areas that are unique to the rural sector and therefore low carbon options for business are not discussed further here.

13 <http://www.scotland.gov.uk/Publications/2009/06/18103720/0>

14 <http://www.scotland.gov.uk/Topics/farmingrural/Agriculture/Environment/climatechange/Advice>

15 Moran, D., M. MacLeod, E. Wall, V. Eory, G. Pajot, R. Matthews, A. McVittie, A. Barnes, B. Rees, A. Moxey, A. Williams, P. Smith (2008) "UK marginal cost curves for the agriculture, forestry, land-use and land-use change sector out to 2022 and to provide scenario analysis for possible abatement options out to 2050"



## 5.4. Managing risks and exploiting opportunities

Regardless of the emission reductions that take place from now on, some degree of warming is inevitable, resulting from historic emissions and inertia in the climate system. Therefore, Scotland must be prepared to take action to minimise risks resulting from changes, and to maximise opportunities arising from the changes both here and elsewhere.

Although the projected impacts for Scotland may not be as severe as in other parts of the world, the changes are still likely to cause important impacts that will need to be adapted to. Adaptation to climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as an 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities'.

Scotland's rural sector faces diverse challenges in terms of adapting to climate change. Natural systems arguably face the biggest challenges. Managed systems, such as agricultural production and human communities may have more options in adapting to the changes. Scotland has species of both plants and animals that are particularly sensitive to changes in climate, notably those with a northern/mountain distribution. For example, the alpine saxifrage (*Saxifraga nivalis*) is currently confined to locations above 837m in Scotland, and is likely to be vulnerable to any future temperature rise<sup>16</sup>. Species with a more southern distribution are likely to benefit from a warming climate as their range increases. These risks are discussed further in the sections 7 and 8, as the two issues of climate change and biodiversity are closely linked.

In terms of agricultural production, as discussed previously, the changes to Scotland's climate are not likely to be as extreme as in other parts of the world. However, there are anticipated to be important changes to flooding and drought frequency, hotter temperatures, and an increased incidence of pests and diseases. On the positive side, farmers are continually adapting to changing conditions, whether they are weather related, political, economic or social. So climate change may not be any different, although the rate and magnitude of changes expected may be beyond what they are currently accustomed or able to adjust to. In most cases, adapting in anticipation of changes is likely to be more cost-effective and successful than waiting to see whether changes will occur before taking action. A range of adaptation options have been identified for the agricultural sector, including behavioural, technical, managerial and infrastructural changes<sup>17</sup>.



The difficulty in adapting in advance of impacts lies in the uncertainty surrounding what the likely impacts will be, where they will occur, and when they will occur. In reality however, perfect foresight is not available, and decision makers must make decisions under a backdrop of considerable uncertainty. While the projections described previously, and others, go a long way towards providing a broad picture of the likely changes, several layers of uncertainty remain associated with them. This uncertainty is likely to remain, and therefore it is important to make decisions that are robust against uncertainty<sup>18</sup>.

What this means in practice is that adaptation actions should where possible be no-regret, in that they would yield benefits even in the absence of climate change, as well as reversible or at least flexible so that if the changes do not eventuate as expected, the adaptation can be modified. So for example, planting trees to provide shade for stock in hotter temperatures will already provide benefits during hot periods today, as well as providing ancillary benefits for biodiversity and carbon sequestration. Allowing greater safety margins in new projects so that if the impacts are worse than the projections, they can still be accommodated is also important. And reducing decision time horizons where possible, so that we are not locked in to decisions that would make us more vulnerable in the future. This is particularly relevant in the forestry sector, where planning operates on a much longer time scale than in agriculture. So-called 'soft' strategies, involving behaviour and management changes rather than 'hard' infrastructural or engineering solutions are likely to be more robust to uncertainty.

There is an important role of Government here in ensuring that farmers have the best information available regarding both impacts and adaptation options, but also in removing any barriers to effective adaptation, and providing an overarching framework to ensure that cumulative effects of adaptations do not lead to unintended negative consequences on other sectors. The Scottish Government has recently released Scotland's Climate Change Adaptation Framework<sup>19</sup> which aims to provide an overarching model for adapting to climate change in Scotland through a national co-ordinated approach.

16 SNH (2009), *Climate change and the natural heritage: SNH's approach and action plan*. Scottish Natural Heritage.

17 Moran, D., Topp, K., Wall, E., Wreford, A (2009), *Climate change impacts on the livestock sector*. Report to Defra AC0307

18 Hallegatte, S. (2009), "Strategies to adapt to an uncertain climate", *Global Environmental Change*, 19, 240 – 247

19 [www.scotland.gov.uk/climatechangeadaptation](http://www.scotland.gov.uk/climatechangeadaptation)

Changes resulting from impacts in other parts of the world will also affect Scotland. Global demand for food and adverse climate conditions in current major food-producing areas, combined with more favourable conditions in Scotland is likely to mean that Scotland's agricultural sector gains in comparative advantage. This has the potential to be an opportunity for rural Scotland, providing the right safeguards are in place to minimise any adverse environmental impacts; as well as ensuring that adverse impacts are prepared for and adapted to in a robust framework.



Some of the greatest changes rural Scotland is likely to have to adapt to, are those that are made by society in response to climate change. These include some of the changes outlined above related to reducing emissions, such as afforestation and bioenergy crops, which may have important impacts on the landscape and other landuses. The development of renewable energy infrastructure may also change the landscape considerably.



### 5.5. Moving forward as a resilient low-carbon sector

The challenge for rural Scotland is to meet the climate change targets for reducing emissions, as well as cope with the physical impacts of climate change, coherently and cohesively without trading one off against the other, all the time maintaining a strong and resilient rural sector.

For both mitigation and adaptation, behaviour change and overcoming barriers are likely to be the biggest issues. Emission reduction targets have tended to become the focus in producers' minds as an immediate priority that has to be addressed. This leads to a danger of not paying sufficient attention to the benefits that adaptation can bring<sup>16</sup>. Adaptation and mitigation are both essential in tackling climate change, however they do add further challenges to a sector that already has to balance a number of different objectives. Climate change is not going to go away however, and it is likely that by adopting new technologies early and taking advantage of opportunities, the Scottish rural sector could prosper under the challenge.



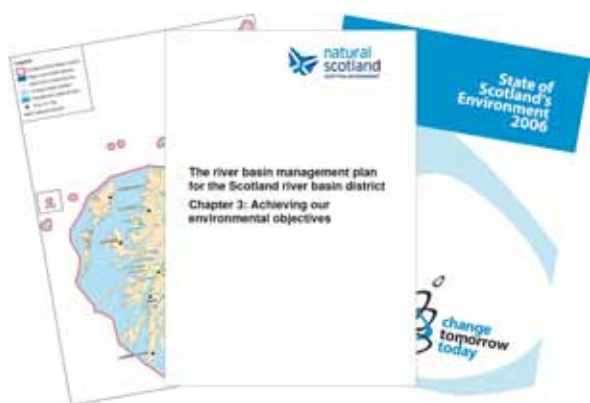
# 6. How effectively is water quality being managed?

Davy McCracken

## Key points:

1. Data on the state of water quality in Scotland suggest that:
  - a. water quality in water bodies is generally good and over the past fifteen years there have been major improvements in the quality of bathing, shellfish and freshwater fish waters
  - b. these improvements are likely partly responsible for increases in the number of aquatic plants and habitat physical quality observed within headwater streams across Scotland between 1998 and 2007
  - c. over 75% of bodies of groundwater, representing over 80% of the area of groundwater, were assessed to be at good status in 2008
2. Recent changes to assessment frameworks have allowed the ecological and wider environmental quality of Scotland's water bodies to be better assessed
3. Water quality will remain an important issue and further improvements will depend largely on the successful management of diffuse pollution from large areas of rural and urban land
4. The intention of SEPA's Diffuse Pollution Mitigation Advisory Group to target diffuse pollution mitigation at sets of priority catchments has the potential to (i) focus farmer attention on their individual responsibilities and (ii) highlight that diffuse pollution can only be tackled effectively through collective action at farm and wider catchment level
5. The implementation of the Water Framework Directive in Scotland provides a large number of challenges, especially with regard to the ability to control diffuse pollution fully and prevent further changes to the morphology of water bodies in the face of ongoing climate change

## 6.1. Introduction



Changes to Scotland's environment are increasingly influenced by human activities. Some of these changes have been very obvious, for example, emissions of pollutants from industrial processes and sewage disposal. Others have been less obvious, such as run-off from agricultural land leading to nutrient enrichment of surface waters and wetland habitats or the contamination of coastal bathing waters with faecal material produced from farmed livestock. In 1996, when the Scottish Environment Protection Agency (SEPA) was formed, some of the key water pollution concerns were<sup>1</sup>:

- In rivers and streams, sewage was identified as being the single most important cause of poor water quality. In addition, both point source and diffuse pollution from agriculture were highlighted as being of considerable importance.
- Pollution from urban drainage was also highlighted as being a relatively new problem for rivers and streams while it was recognised that the impact of industrial discharges upon freshwater had been reduced dramatically over the previous 20 years.
- In lochs, the major concerns were with nutrient enrichment and associated eutrophication and the fact that at that time there were no national reviews of loch water quality.
- In estuaries and coastal waters, discharges of degradable organic material and the disposal of sewage effluents were highlighted as major issues which were starting to be addressed effectively.

Four years later, in December 2000 the European Water Framework Directive (WFD) came into force and established a new legal framework for the protection, improvement and sustainable use of all water bodies (i.e. all rivers, canals, lochs, estuaries, wetlands and coastal waters as well as water under the ground) across Europe. The WFD provided the Scottish Government, SEPA and all of Scotland's other responsible authorities and public bodies with additional responsibilities to protect and improve Scotland's water environment, including preventing deterioration of aquatic ecosystems and, where possible, restoring surface waters and groundwater damaged by pollution, water abstraction, dams and engineering activities to 'good status'.

So what has been the impact on water quality in Scotland over the last 15 years of SEPA and the Scottish Government's combined strategy of raising awareness of water quality issues; developing and enforcing relevant environmental legislation; researching and developing appropriate pollution mitigation measures; and working with a wide range of partners to provide guidance, advice and encouragement on the best ways to implement such measures?

<sup>1</sup> SEPA (1996), *The State of the Environment Report 1996*. Scottish Environment Protection Agency



## 6.2. What impact have pollution control measures had?

SEPA's many responsibilities not only include regulating activities that may pollute water, land or air but also monitoring, analysing and reporting on the state of Scotland's environment. This provides a wide-range of comprehensive datasets to draw on, many of them updated on an annual basis. SEPA's River Basin Management Planning process (in which Scotland is divided into two River Basin Districts – RBDs) which is required under the implementation of the Water Framework Directive also provides an invaluable source of useful up-to-date data which can be used to illustrate issues at a regional level<sup>2</sup>. Indeed, the amount of information available is so much that it is not possible (nor is it intended) to try and do it justice in a few short pages. Instead the following highlights some of the key facts emerging from the monitoring of physical and ecological characteristics of Scotland's freshwater resource and related aspects of bathing water quality assessments.

### 6.2.1. Trends in water quality

The quality of water is important not only because it dictates its suitability for use in a variety of essential human needs and activities (e.g. drinking water supply, fisheries, recreation, etc.) but also because it affects the populations of the many species which it supports. Since its inception in 1996, SEPA has conducted extensive monitoring of rivers, lochs, estuaries and coastal waters and, to a more limited extent, groundwater. Historically these monitoring results were combined such that each qualifying body of water in Scotland was placed into one of four or five classification bands, which described its condition ranging from excellent or good quality, through fair and poor quality to seriously polluted. Such historic classifications were updated every year (or every five years for lochs)<sup>3</sup>.

In order to meet the requirements of the Water Framework Directive, SEPA has implemented a new monitoring scheme and classification methodology with 2007 being set as the baseline year for the updated classification of Scotland's water environment. This classification puts a greater emphasis on ecological potential and incorporates the potential impacts of activities such as abstractions and changes to water body morphology. The new classifications assesses each body of water as being either of High, Good, Moderate, Poor or Bad ecological status<sup>4</sup>.

**Table 1. Status of surface waters in Scotland in 2008 as assessed by SEPA as part of the River Basin Management Planning process. The table shows status data for both (a) the Scotland River Basin District and (b) the Solway Tweed River Basin District<sup>5</sup>. Note that the figures given here for the latter are for the whole of that RBD, i.e. they include the proportion of the RBD which is within England.**

| Status                    | Rivers                 |             | Lochs                  |                         | Estuaries              |                         | Coastal waters         |                         |        |
|---------------------------|------------------------|-------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|--------|
|                           | Number of water bodies | Length (km) | Number of water bodies | Area (km <sup>2</sup> ) | Number of water bodies | Area (km <sup>2</sup> ) | Number of water bodies | Area (km <sup>2</sup> ) |        |
| High/Maximum              | (a)                    | 191         | 1520                   | 61                      | 145                    | 14                      | 161                    | 158                     | 15,695 |
|                           | (b)                    | 5           | 39                     | 0                       | 0                      | 5                       | 57                     | 0                       | 0      |
| Good                      | (a)                    | 935         | 9434                   | 143                     | 493                    | 20                      | 310                    | 263                     | 26,191 |
|                           | (b)                    | 230         | 2487                   | 7                       | 5                      | 5                       | 27                     | 7                       | 1,871  |
| Moderate                  | (a)                    | 407         | 4650                   | 48                      | 173                    | 5                       | 125                    | 28                      | 3,909  |
|                           | (b)                    | 203         | 2583                   | 20                      | 32                     | 1                       | 306                    | 1                       | 42     |
| Poor                      | (a)                    | 300         | 3098                   | 39                      | 126                    | 1                       | 10                     | 0                       | 0      |
|                           | (b)                    | 65          | 777                    | 4                       | 5                      | 0                       | 0                      | 0                       | 0      |
| Bad                       | (a)                    | 180         | 2115                   | 18                      | 74                     | 0                       | 0                      | 0                       | 0      |
|                           | (b)                    | 23          | 296                    | 4                       | 3                      | 0                       | 0                      | 0                       | 0      |
| Total                     | (a)                    | 2013        | 20,817                 | 309                     | 961                    | 40                      | 606                    | 449                     | 45,795 |
|                           | (b)                    | 526         | 6,182                  | 35                      | 45                     | 11                      | 390                    | 8                       | 1,913  |
| Proportion good or better | (a)                    | 56%         | 53%                    | 66%                     | 65%                    | 85%                     | 78%                    | 94%                     | 91%    |
|                           | (b)                    | 45%         | 41%                    | 20%                     | 11%                    | 91%                     | 22%                    | 88%                     | 98%    |

<sup>2</sup> SEPA River Basin Planning [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx) Note that for planning purposes Scotland is divided into two River Basin Districts (RBDs): the Scotland RBD stretches from the Shetland and Orkney Islands in the far north of Scotland to the Southern Uplands in the south, and from Rockall and the islands of the Outer Hebrides and St Kilda in the Atlantic to the North Sea coasts of eastern Scotland; the Solway Tweed RBD incorporates the Scottish Borders, Dumfries and Galloway, small parts of Ayrshire in Scotland and parts of Northumbria and Cumbria in England.

<sup>3</sup> SEPA (2007), *National water quality classification 2006*. Scottish Environmental Protection Agency [http://www.sepa.org.uk/water/monitoring\\_and\\_classification/previous\\_schemes.aspx](http://www.sepa.org.uk/water/monitoring_and_classification/previous_schemes.aspx)

<sup>4</sup> SEPA *Water Monitoring and Classification*. [http://www.sepa.org.uk/water/monitoring\\_and\\_classification.aspx](http://www.sepa.org.uk/water/monitoring_and_classification.aspx)

<sup>5</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 1: State of the water environment*. [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

## 6.2.2. The quality of Scottish water bodies

Table 1 summarise the classification status of surface waters (rivers, lochs, estuaries and coastal waters) in Scotland in 2008. Just over 63% and 45% of surface water bodies were at good or better status in the Scotland RBD and Solway Tweed RBD, respectively<sup>6</sup>. The relatively high proportion of some Scottish surface waters achieving good or better status reflects the fact that many are little disturbed by human activity compared to the majority of water bodies elsewhere in the UK and Europe.

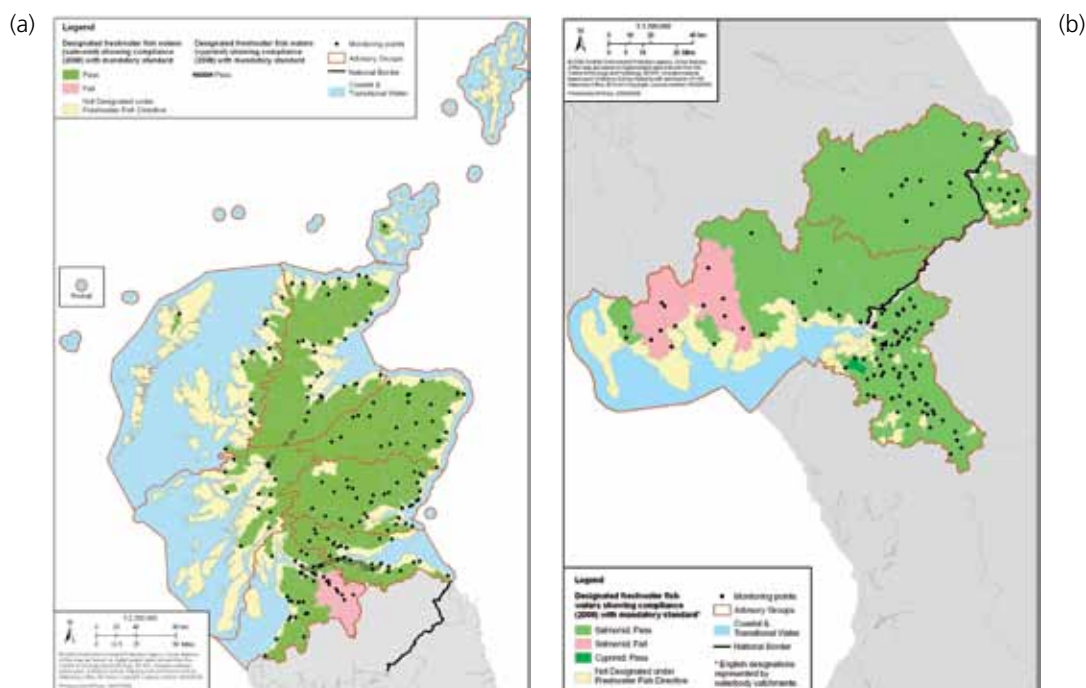
The data in Table 1 contrast with the situation in 2006, when 79% of the length of Scotland's rivers and streams, 96% of its area of estuaries and 99% of its coastal waters were assessed to be in excellent or good quality (using the historic classification approach)<sup>7</sup>. However, the difference between 2006 and 2008 does not necessarily represent a deterioration in those water quality indicators assessed in 2006 but rather is a result of incorporating a new range of measures of environmental quality in 2008 which highlighted the impacts of abstractions, impoundments and changes in morphology in some water bodies<sup>8</sup>. The new classification provides the most comprehensive assessment to date of the condition of Scotland's water environment and is a firm base on which to build future trend analyses<sup>9</sup>.

## 6.2.3. The quality of Scottish freshwater fish waters

Further evidence of the generally high quality of Scotland's water bodies comes from SEPA's assessment of the water quality of each area protected for freshwater fish and associated comparison with the requirements for the areas by the Freshwater Fish Directive (Figure 1). There are currently 104 and 256 protected areas for freshwater fish within the Scotland and Solway Tweed RBDs, respectively. Each protected area comprises one or more water bodies.

Of the 104 designated waters within the Scotland RBD, 101 are designated as salmonid waters<sup>10</sup> and three as cyprinid waters<sup>11</sup>. Fifteen of the 253 designated salmonid waters within the Solway Tweed fall within Scotland. All the areas protected for freshwater fish in the Scotland RBD are currently achieving the required standards with the exception of the River Clyde. The total length of the River Clyde protected for freshwater fish is 791 km of river from the rural headwaters to the estuary in the city of Glasgow.

**Figure 1. Designated freshwater fish waters and results of the 2008 Freshwater Fish Directive assessment conducted by SEPA within (a) the Scotland RBD<sup>12</sup> and (b) the Solway Tweed RBD<sup>13</sup>.**



<sup>6</sup> Water bodies vary in size and this means that a particular number of water bodies does not correspond to a given area or length of surface water. For completeness, Table 1 provides information on both the number of water bodies and the corresponding length or area of surface water they represent

<sup>7</sup> SEPA (2007), *National water quality classification 2006*. Scottish Environmental Protection Agency [http://www.sepa.org.uk/water/monitoring\\_and\\_classification/previous\\_schemes.aspx](http://www.sepa.org.uk/water/monitoring_and_classification/previous_schemes.aspx)

<sup>8</sup> The size of the network assessed in 2006 was also different from the 2008 network, which further complicates comparison.

<sup>9</sup> SEPA (2009), *2007 Water environment classification report*. Scottish Environmental Protection Agency [http://www.sepa.org.uk/water/monitoring\\_and\\_classification.aspx](http://www.sepa.org.uk/water/monitoring_and_classification.aspx)

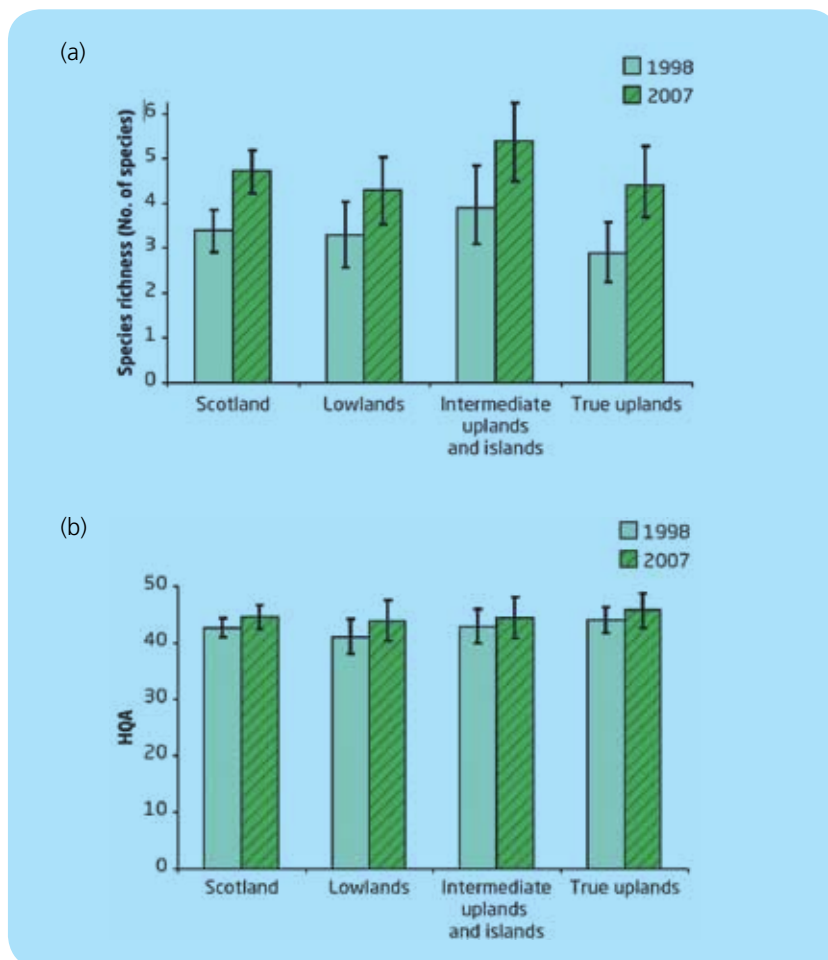
<sup>10</sup> Salmonid waters are waters that support or become capable of supporting fish belonging to species such as salmon, trout, grayling and whitefish. [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>11</sup> Cyprinid waters are waters that support or become capable of supporting fish belonging to the cyprinids (family of fish including carp, tench, roach, rudd, dace) or other species such as pike, perch and eel. [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>12</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 5: Protected areas*. [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>13</sup> SEPA River Basin Planning. *The river basin management plan for the Solway Tweed river basin district. Chapter 5: Protected areas*. [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

Figure 2. Countryside Survey 2007 results of headwater stream (a) aquatic plant species richness and (b) Habitat Quality Assessment (HQA). Means for 1998 and 2007 are provided for all samples taken across Scotland and for those within each of the three Environmental Zones recognised by the Countryside Survey. 95% confidence intervals are shown for each data point<sup>14</sup>.



This designation has been divided into 10 sub-designations, nine of which achieved the required water quality standards in 2008. The lower River Clyde, a 54 km stretch of river that was newly designated in late 2007, did not achieve the required value for total ammonium in 2008. In 2008, three of the 15 salmonid waters located within Scotland in the Solway Tweed RBD did not meet the required standards. All three of these waters are impacted by acid deposition, resulting in a lower pH than specified by the Freshwater Fish Directive. Past forestry management practices in their catchments has compounded the problem of low pH in the water bodies

#### 6.2.4. Changes in the vegetation and physical quality of streams

The 2007 Countryside Survey<sup>15</sup> (which was funded by a consortium including Scottish Government and Scottish Natural Heritage and implemented by the Centre for Ecology & Hydrology) assessed the diversity and cover of aquatic (within the water) plants recorded over a 100 m length of stream channel at 162 sample sites in 2007 and compared the findings with similar samples taken in 1998 (Figure 2a). The findings show that the number of plant species in Scottish streams increased between 1998 and 2007 and this trend was seen in all three Environmental Zones (Lowlands, Intermediate Uplands & Islands, True Uplands) recognised by the Countryside Survey.

There were also small but significant improvements in habitat physical quality of headwater streams in Scotland between 1998 and 2007 (Figure 2b), though these trends were not significant by Environmental Zone. Between 1998 and 2007, natural riparian land cover (within 50 m of the stream) increased, e.g. woodland and in-stream woody debris and natural bank features such as gravel side bars.

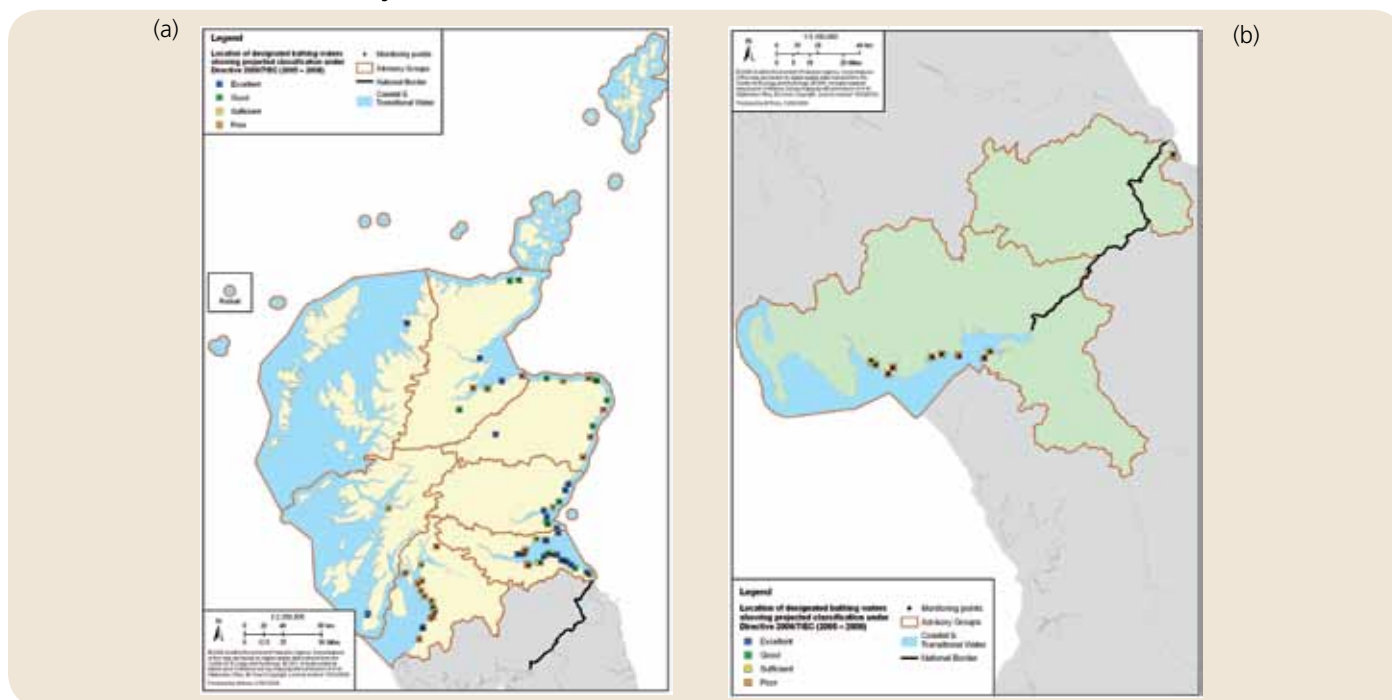
These improvements in the biological and physical condition of headwater streams in Scotland are likely to reflect the efforts made over the past 20 years to strengthen environmental regulations and improve management of rivers and streams in Scotland.

<sup>14</sup> Norton, L.R.; Murphy, J.; Reynolds, B.; Marks, S.; Mackey, E.C. (2009), *Countryside Survey: Scotland Results from 2007*. NERC/Centre for Ecology & Hydrology, The Scottish Government, Scottish Natural Heritage, 83pp. (CEH Project Number: C03259) Chapter 8: Rivers, Streams and Standing Waters <http://www.countrysidesurvey.org.uk/pdf/reports2007/scotland2007/CS-Scotland-Results2007-Chapter08.pdf>

<sup>15</sup> Norton, L.R.; Murphy, J.; Reynolds, B.; Marks, S.; Mackey, E.C. (2009), *Countryside Survey: Scotland Results from 2007*. NERC/Centre for Ecology & Hydrology, The Scottish Government, Scottish Natural Heritage, 83pp. (CEH Project Number: C03259). [http://www.countrysidesurvey.org.uk/scots\\_reports2007.html](http://www.countrysidesurvey.org.uk/scots_reports2007.html)



**Figure 3. Designated bathing waters and projected classification, based on data from 2005 to 2008, under the revised bathing Water Directive as assessed by SEPA as part of the River Basin Management Planning process within (a) the Scotland RBD<sup>16</sup> and (b) the Solway Tweed RBD<sup>17</sup>.**



### 6.2.5. The quality of bathing waters

Over the last decade, coastal water quality has improved as a result of the application of full treatment to sewage discharges, improved treatment of industrial effluents, and efforts to reduce diffuse pollution. Figure 3 shows the location of 83 designated bathing waters in Scotland (three of which are in freshwater) and their projected classification by SEPA under the revised bathing Water Directive. It can be seen that in 2008 52 out of these 83 waters were classified as having “sufficient” or better bathing water quality, based on annual data collected between 2005 and 2008.

Hot spots are also evident, with many of the bathing waters along the Clyde and Solway coast in particular being designated as having poor water quality overall during this period. The quality of individual bathing waters does, however, vary from year to year and in 2008 itself, 73 (91%) of the 80 designated coastal bathing waters met the EU mandatory standards. Although these compliance results are lower than in some previous seasons, they can be explained by the very wet weather recorded through much of Scotland during the bathing season in 2008 (since high rainfall increases run off into water courses of livestock faecal material from agricultural land and also causes overflows from sewage treatment works and sewers)<sup>18</sup>.

### 6.2.6. Nutrient enrichment of groundwater

Nutrients such as nitrogen and phosphorus are essential to support life and are naturally ‘cycled’ within the environment, but the balance of these cycles can be disturbed by the addition of extra nutrients. Poor application methods and/or the oversupply of nutrients in fertilisers (especially from livestock manures), the discharge of nutrients to water and the deposition of nitrogen compounds emitted to air result in nutrient enrichment of soil, vegetation and water. Elevated levels of nitrogen and phosphorus may lead to eutrophication, a process of undesirable ecological change (including adverse effects on biodiversity) induced by nutrient enrichment. Eutrophication can be particularly serious in freshwaters where the effects may interfere with recreational activities and drinking water treatment processes, as well as loss of amenity and biodiversity<sup>19</sup>.

The key source of elevated nitrate in groundwaters is agricultural land. If the total store of nitrogen in the soil exceeds that required for plant growth, some of the excess will be leached into the underlying groundwater. Some nitrate-enriched groundwater may subsequently find its way into surface waters. Groundwaters with elevated nitrate concentrations tend to be found in the more intensively farmed areas of eastern Scotland. In response to this problem, four Nitrate Vulnerable Zones (NVZs) amounting to 14% of the land area of Scotland have been designated and NVZ action programmes have been put in place to reduce pollution by nitrates from agricultural sources.

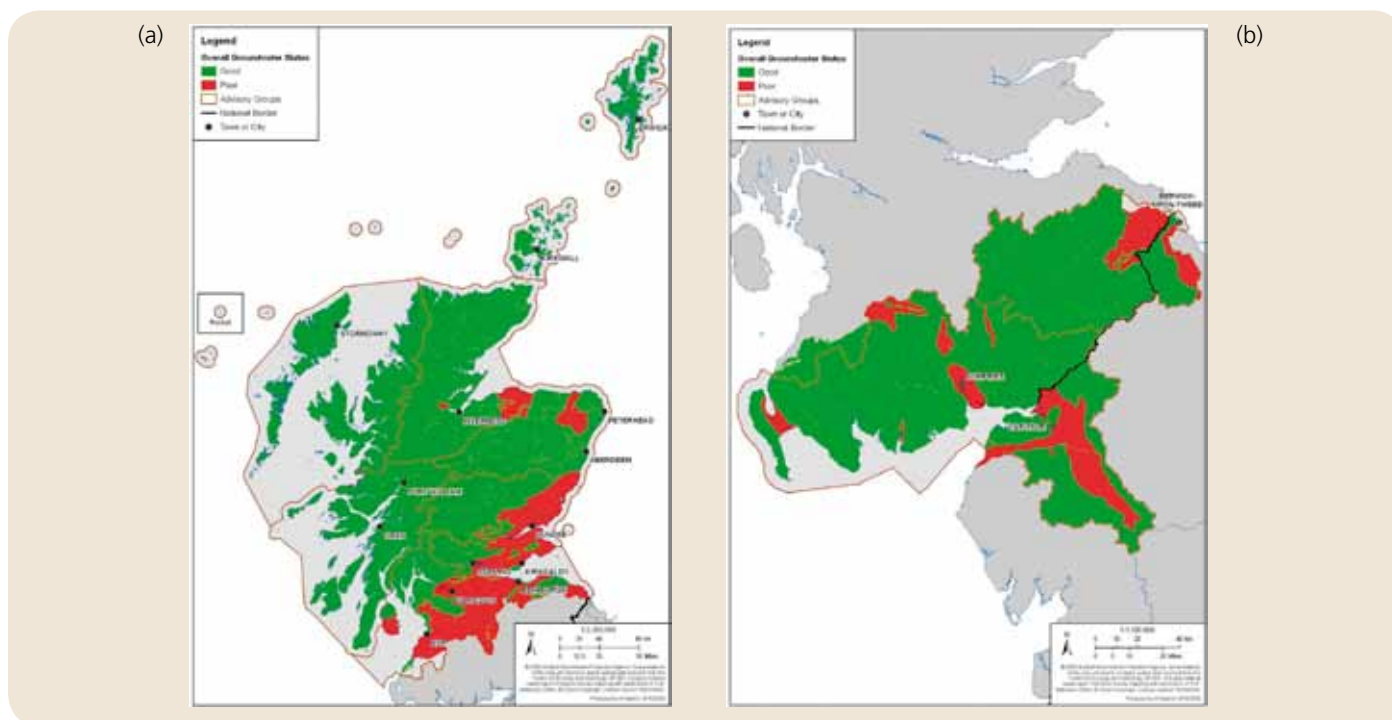
<sup>16</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 5: Protected areas.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>17</sup> SEPA River Basin Planning. *The river basin management plan for the Solway Tweed river basin district. Chapter 5: Protected areas.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>18</sup> SEPA Bathing Water Quality Reports. *Scotland's Bathing Waters 2008.* [http://www.sepa.org.uk/scotlands\\_environment/data\\_and\\_reports/water/bathing\\_waters.aspx](http://www.sepa.org.uk/scotlands_environment/data_and_reports/water/bathing_waters.aspx) Note that the published data for 2008 used the historic assessment method and hence is not intended to be compared directly with the maps in Figure 3, where that overall assessment was based on updated assessment methods. Using the historic assessment approach, 91% (73 out of 80), 88% (52 out of 59) and 100% (61 out of 61) identified coastal bathing waters were assessed as meeting the EU mandatory standards in 2008, 2007 and 2006, respectively.

<sup>19</sup> SEPA Nitrate Monitoring Network [http://www.sepa.org.uk/water/groundwater/monitoring/nitrate\\_monitoring.aspx](http://www.sepa.org.uk/water/groundwater/monitoring/nitrate_monitoring.aspx)

**Figure 4. Groundwater status in Scotland in 2008 as assessed by SEPA as part of the River Basin Management Planning process within (a) the Scotland RBD<sup>20</sup> and (b) the Solway Tweed RBD<sup>21</sup>**



Monitoring of the concentration of nitrate in groundwater occurs at around 200 sites across Scotland. Figure 4 summarise the overall classification results for groundwater by SEPA in both the Scotland RBD and Solway Tweed RBD in 2008 as part of the River Basin Management Planning process. The classification distinguishes whether bodies of groundwater are in a good or poor condition and takes account of whether or not the water bodies are polluted and whether or not the volume of any water being abstracted from them is sustainable without significant impacts on rivers or wetlands that depend on the groundwater. Across both RBDs, over 75% of bodies of groundwater, representing over 80% of the area of groundwater, were at good status in 2008.

However, concentrations at several boreholes and springs are failing to meet the European Union standard for drinking water quality (i.e. the threshold of 50 mg/l is being exceeded for at least 5% of the time). Monitoring since 2002 indicates a mixed picture. It is clear that the majority of sites with elevated concentrations, in both ground and surface waters, are located within the NVZs. It is also apparent that whilst the NVZ Action Programme is playing its part, it cannot be said to have reduced nitrate concentrations in either surface or ground waters to such an extent as to suggest a change in the NVZ designations<sup>22</sup>. Those sites outwith NVZs that are showing elevated nitrates are being investigated by SEPA to determine the reasons. It may be that some sites are being influenced by local sources of pollution including sewage discharges or else are not representative of the groundwater.

### 6.3. How effectively is water quality being managed?

#### 6.3.1. Continuing pressures on water quality

Water quality in water bodies in Scotland is generally good and is improving due to a reduction in point-source discharges. As a result, over the past fifteen years, there have been marked improvements in the quality of bathing, shellfish and freshwater fish waters. However, the major pressures likely to continue into the future differ little from those identified by SEPA in 2006<sup>23</sup> or 1996<sup>24</sup>:

- In rivers, the largest impacts are likely to remain those caused by diffuse pollution from farmland and urban areas, and the disposal of sewage.
- In freshwater lochs, the most significant point sources are likely to continue to be sewage disposal and fish farms, while the main sources of diffuse pollution are likely to continue to be farmland and forestry, reflecting the rural setting of most lochs.
- For groundwaters, the main sources of diffuse pollution are highly likely to remain drainage from farmland and urban areas. Groundwaters are particularly vulnerable to a build-up of nitrate from fertiliser and pesticides which are washed down when excessive amounts are applied to farmland.

<sup>20</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 1: State of the water environment.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>21</sup> SEPA River Basin Planning. *The river basin management plan for the Solway Tweed river basin district. Chapter 1: State of the water environment.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>22</sup> SEPA (2006), *State of Scotland's Environment 2006.* Scottish Environmental Protection Agency [http://www.sepa.org.uk/scotlands\\_environment/data\\_and\\_reports/state\\_of\\_the\\_environment.aspx](http://www.sepa.org.uk/scotlands_environment/data_and_reports/state_of_the_environment.aspx)

<sup>23</sup> SEPA (2007), *National water quality classification 2006.* Scottish Environmental Protection Agency [http://www.sepa.org.uk/water/monitoring\\_and\\_classification/previous\\_schemes.aspx](http://www.sepa.org.uk/water/monitoring_and_classification/previous_schemes.aspx)

<sup>24</sup> SEPA (1996), *The State of the Environment Report 1996.* Scottish Environmental Protection Agency

- Point source pollution from sewage and industry is still likely to remain an important threat to the quality of estuary and coastal water bodies. Although there has been considerable investment in sewerage infrastructure over the past fifteen years, there is still likely to be many discharges from sewer overflows during periods of wet weather in towns and cities along the coast.

Nutrient enrichment of rivers, lochs and groundwater can damage ecosystems and is a significant problem in some areas. The area of semi-natural terrestrial habitats at risk from nitrogen deposition has declined, but the potential for damage to specific habitats remains high. Emissions of nitrogen oxides to air show a downward trend and ammonia emissions are now the dominant source of nitrogen deposition and remain a major problem. Better targeting and supply of nutrients in fertilisers can prevent nutrient enrichment and it is expected that actions within the Scottish Rural Development Programme (SRDP) should lead to improvements in nutrient management of soils. However, the major challenges are likely to be tackling diffuse pollution and reducing emissions of ammonia<sup>25 26</sup>.

## In Focus: The SAC Environmental Focus Farms project

SAC is working in partnership with SEPA and the Macaulay Institute as part of the Monitored Priority Catchment Project, which aims to establish monitored baselines against which the effectiveness of measures, described in the River basin Management Planning process, can be assessed. To this end, SAC has established an Environmental Focus Farm in each of two catchments selected as being representative of land use patterns typical of east-coast arable agriculture and west-coast dairying respectively and because they are impacted by diffuse pollution.

- The Lunan Water catchment in Angus includes two lochs that are Sites of Special Scientific Interest: Rescobie Loch and Loch of Balgavies. Rescobie Loch in particular has experienced significant nutrient over-enrichment, and algal blooms are a problem. As well as nutrients, sediment and, to a lesser extent, pesticides are under study in the catchment.
- The Cessnock Water in Ayrshire is a tributary to the River Irvine which discharges at Irvine Beach. This is a designated Bathing Beach and the condition of bathing waters here have a historically poor quality record for Faecal Indicator Organisms. As well as agriculturally-derived faecal matter, the River Irvine catchment also contains sewer overflows, emergency outfalls and septic tanks. Nutrient over-enrichment of the Cessnock is a problem with high Biochemical Oxygen Demand materials being of particular concern because of their potential for water de-oxygenation and consequent impacts on freshwater ecology.

The Environmental Focus Farm Project is running from 2006-2011 and involves the assessment of existing practices, the implementation of Best Management Practices (BMPs) and the provision of background information and support to farmers group members within each catchment. The BMPs' effectiveness, using pre- and post-implementation monitoring, as well as the costing implications, and "practicality" of the BMPs selected, are being evaluated. Their fit within existing and proposed agri-environment support schemes will be also considered as part of the mechanism for rolling out the favoured BMPs to the wider farming community within each catchment and, eventually, across Scotland.

In addition to SAC's contribution, The Macaulay Institute are carrying out monitoring in the Lunan Water catchment and SEPA are monitoring various surface and ground water parameters in both catchments.

### 6.3.2. Tackling diffuse pollution

Further improvements to water quality will therefore depend largely on the successful management of diffuse pollution from large areas of rural and urban land and this is reflected in the actions highlighted in the River Basin Management Planning process<sup>27 28</sup>. In particular, the recent creation by SEPA of a new Diffuse Pollution Management Advisory Group (DPMAG) is potentially a major step forward in encouraging an integrated approach to tackling diffuse pollution concerns. The DPMAG is a partnership of a range of relevant authorities, land manager representatives and voluntary organisations. It is intended that the DPMAG will develop and implement a detailed plan for using a range of legislative, economic and educational mechanisms to address diffuse pollution issues in Scotland.

The Scottish Government has also recently brought together nine public bodies to form Scotland's Environmental and Rural Services (SEARS)<sup>29</sup>. This partnership will also contribute to implementing the plans for tackling diffuse pollution by providing coordinated

<sup>25</sup> SEPA (2006), *State of Scotland's Environment 2006*. Scottish Environmental Protection Agency [http://www.sepa.org.uk/scotlands\\_environment/data\\_and\\_reports/state\\_of\\_the\\_environment.aspx](http://www.sepa.org.uk/scotlands_environment/data_and_reports/state_of_the_environment.aspx)

<sup>26</sup> Scottish Government High Level Summary of Statistics Trend website. In Scotland, over the period 1996 to 2008 there has been a 62% decrease in emissions of sulphur dioxide and a 29% decrease in emissions of nitrogen oxides from large combustion plants. These reflect similar changes at a UK and wider European level <http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment/TrendAir>

<sup>27</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 3: Achieving our environmental objectives.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>28</sup> SEPA River Basin Planning. *The river basin management plan for the Solway Tweed river basin district. Chapter 3: Achieving our environmental objectives.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>29</sup> The SEARS partners are Animal Health, Cairngorms National Park Authority, Crofters Commission, Deer Commission for Scotland, Forestry Commission Scotland, Loch Lomond and The Trossachs National Park Authority, SEPA, Scottish Government and Scottish Natural Heritage. Further information on SEARS can be found on its website at: [www.sears.scotland.gov.uk](http://www.sears.scotland.gov.uk)



education and advice (awareness raising, training and guidance) to rural land managers. SEPA's SEARS partners will also carry out farm inspections on behalf of SEPA to check that good environmental practice requirements are being met.

SEPA and its SEARS partners will be able to provide advice based on a range of current guidance concerning good environmental practice requirements, including: SEARS diffuse pollution information leaflets<sup>30</sup>; the Code of Good Agricultural Practice (PEPFAA code)<sup>31</sup>; the Scottish Best Management Practice Handbook<sup>32</sup>; the Practical Guide to the Water Environment (Controlled Activities)(Scotland) Regulations (2005)<sup>33</sup>; and Scottish Natural Heritage's Targeted Inputs for a Better Rural Environment (TIBRE) initiative<sup>34</sup>.

The principal measures employed by the DPMAG and its partners to improve the water quality of surface waters and groundwater affected by diffuse pollution from agricultural sources will be based on a two tier strategy comprising<sup>35</sup>:

- A new national campaign of awareness raising to promote compliance with the requirements of the Water Environment (Controlled Activities)(Scotland) Regulations 2005. The campaign will be organised and delivered by SEPA, its SEARS partners and members of the DPMAG and SEPA's local Area Advisory Groups. This will involve a comprehensive programme of guidance and training for land managers on required good environmental practices and include farm inspections to check good practices are actually being adopted.
- Additional targeted efforts to improve the management of diffuse pollution within a number of river catchments identified as "priority" catchments because diffuse pollution from agriculture is a major issue in those catchments and the scale of pollution reduction needed will require planned and targeted actions to be identified in discussion with the farmers concerned.

#### 6.4. What are the major challenges for the future?

It is clear that major advances have been made over the past fifteen years and that it is recognised that the water environment in Scotland has fewer environmental problems than most other parts of the UK. However, a healthy water environment is not only about how clean the water is but also about the impacts of human activities on the quantity of water, the natural form of beds, banks and shores and the impact of non-native invasive species. Taking all of these into account, 63% of Scotland's rivers, lochs, reservoirs, canals, estuaries, coasts and groundwaters are currently in good or better condition. The launch of SEPA's River Basin Planning programme has set out how they and their partners plan to work to improve that figure further, with the aim of bringing 97% of Scotland's water bodies up to good status by 2027<sup>36</sup>.

As indicated above, these new strategies and legislation are driven by the need to ensure that Scotland is compliant with the European Water Framework Directive. Good progress has already been made with addressing issues necessary to comply with existing legislation such as the Bathing Water Directive. However, both directives have clearly highlighted the risk that diffuse pollution from agricultural sources can have on Scotland's water quality. Hence diffuse pollution monitoring and mitigation from rural land uses is a major objective of Scotland's WFD strategy and is a focal point for the activities of the Scottish Government, SEPA's DPMAG and its SEARS partners.

However, although measures to help tackle diffuse pollution are currently available in the SRDP, it would appear that similar difficulties to those highlighted in the farmland biodiversity section (Section 7) are being experienced when relying on farmers to voluntarily take-up diffuse pollution mitigation actions. Table 2 shows the ranking of the ten most funded SRDP Rural Priority options directly associated with the control of diffuse pollution, once all 126 SRDP options listed on the SRDP website have been placed in descending order with regard to the amount of funding which had been committed after the first five rounds of consideration of applications across Scotland. Although just over £13 million has been committed to these ten diffuse pollution related options, the uptake of each of these does not seem as popular as many of the top ten Rural Priority options listed in the biodiversity section of this report (Section 7), such as Restructuring agricultural businesses (c. £28 million), Hedgerows – 3 years for biodiversity benefits (c. £13 million), Open grazed or wet grassland for wildlife (c. £12 million) or Diversification outwith agriculture (c. £11 million).

Hence, as with the scale of actions required for farmland biodiversity improvements, there also appears to be a pressing need to encourage more farmers to access the diffuse pollution options available through the SRDP. Consequently, the intention of SEPA's DPMAG to concentrate and target their diffuse pollution mitigation activities to a range of 14 high priority river catchments within the Scotland (12 priority catchments) and Solway Tweed (2 priority catchments) RDBs between now and 2015 should help in this regard<sup>37 38</sup>.

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<sup>30</sup> SEARS diffuse pollution information leaflets are available from: [www.sepa.org.uk/water/water\\_regulation/regimes/pollution\\_control/diffuse\\_pollution.aspx](http://www.sepa.org.uk/water/water_regulation/regimes/pollution_control/diffuse_pollution.aspx)

<sup>31</sup> The Code of Good Agricultural Practice (PEPFAA code) is available at: [www.scotland.gov.uk/Resource/Doc/37428/0014235.pdf](http://www.scotland.gov.uk/Resource/Doc/37428/0014235.pdf)

<sup>32</sup> The Scottish Best Management Practice Handbook is available at: [www.sepa.org.uk/bmp](http://www.sepa.org.uk/bmp)

<sup>33</sup> The Practical Guide to the Water Environment (Controlled Activities)(Scotland) Regulations (2005) is available at: <http://www.sepa.org.uk/water/regulations.aspx>

<sup>34</sup> Information on Scottish Natural Heritage's Targeted Inputs for a Better Rural Environment (TIBRE) initiative is available at: [www.snh.org.uk/tibre](http://www.snh.org.uk/tibre)

<sup>35</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 3: Achieving our environmental objectives.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>36</sup> New targets for Scotland's water unveiled by SEPA, 17 November 2009. [http://www.sepa.org.uk/about\\_us/news/2009/new\\_targets\\_for\\_scotland%E2%80%99s\\_wat.aspx](http://www.sepa.org.uk/about_us/news/2009/new_targets_for_scotland%E2%80%99s_wat.aspx)

<sup>37</sup> SEPA River Basin Planning. *The river basin management plan for the Scotland river basin district. Chapter 3: Achieving our environmental objectives.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>38</sup> SEPA River Basin Planning. *The river basin management plan for the Solway Tweed river basin district. Chapter 3: Achieving our environmental objectives.* [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

SEPA has already started detailed studies of these 14 catchments to identify pollutant sources and possible actions. These studies will form the basis of detailed plans for co-ordinating the work of SEPA, its SEARS partners and other organisations in working with farmers to ensure the appropriate Best Management Practice (MBP) diffuse pollution mitigation actions are taken. This catchment-targeting approach (with an additional set of priority river catchments being targeted between 2015 and 2021 and a further set between 2021 and 2027) has the potential not only to focus farmer attention in each catchment on their individual responsibilities but also to highlight that diffuse pollution can only be tackled effectively through the collective implementation of BMPs at farm and wider catchment level.

**Table 2. The position of the ten most funded SRDP Rural Priority options directly associated with the control of diffuse pollution once all 126 SRDP options listed on the SRDP website are placed in descending order with regard to the amount of funding which had been committed after the first five rounds of consideration of applications across Scotland** <sup>39</sup>

| Ranking based on funds committed                                      | Option Description                                     | Cases with Option | Total amount of funds committed |
|---|--|-------------------|---------------------------------|
| 7   | Manure/slurry storage and treatment - manure storage   | 128               | £5,976,960                      |
| 11  | Water Margins - Enhance biodiversity                   | 775               | £3,720,175                      |
| 14  | Management of Wetland                                  | 590               | £2,170,219                      |
| 54  | Water Margins - reduce diffuse pollution               | 94                | £457,766                        |
| 55  | Buffer Areas for Fens and Lowland Raised Bogs          | 14                | £392,069                        |
| 57  | Create, Restore and Manage Wetland                     | 43                | £391,304                        |
| 90  | Manure/slurry storage and treatment - manure treatment | 4                 | £44,061                         |
| 92  | Livestock tracks, gates and river crossings            | 8                 | £42,801                         |
| 108   | Soil and water management programme – plan             | 17                | £4,650                          |
| 112   | Nutrient management plan                               | 12                | £2,372                          |
| Total amount of funding committed to these ten options:               |  |                   | £13,202,377                     |
| Overall total amount of funds committed to all 126 available options: |  |                   | £157,375,157                    |

The catchment-targeting approach also has the potential to act as powerful framework for encouraging additional collaborative actions within each catchment with regard to other environmental concerns (such as farmland biodiversity conservation or climate change mitigation) where collective action is likely to produce benefits which are more than just the sum of the parts. Such an approach will, however, have to be careful to ensure that the appropriate scale of all the measures necessary can be achieved and to ensure that any potential conflicts between measures are addressed before being implemented on the ground.

Just as importantly, once the appropriate policies and practices for diffuse pollution mitigation in each catchment have been identified it will not be enough simply to make these available within SRDP or catchment-specific programmes. The farmers and land managers within those catchments need to accept that it is they who are ultimately responsible for ensuring that diffuse pollution is addressed effectively and hence need to appreciate the importance of actively engaging with the process. The ongoing challenge for SEPA and its SEARS partners will be in finding an appropriate balance between encouragement and enforcement – too much of the former may mean that not enough farmers voluntarily engage with the BMP process while too much of the latter may mean that the BMPs are not implemented as effectively as they could otherwise be. The major challenge will be in striking such a balance at a time when, as indicated by the recent ADAS/SAC study highlighted in the farmland biodiversity section, the overall amount of funds currently available for agri-environment activities within the SRDP are insufficient on their own to deal with the scale of all the environmental actions required within Scotland<sup>40</sup>.

Finally, under the WFD there is a requirement to ensure no deterioration in the status of waterbodies and the actions detailed within the Scottish River Basin Planning process are all focused on this end. Good progress has been made in ensuring that new monitoring and classification systems are now in place to ensure that water body status can be assessed effectively. It should, however, be remembered that good ecological status within the WFD includes not only water quality but also water quantity, ecology and habitat and morphology/physical attributes. The WFD does not only require that these latter attributes be assessed but also that where necessary remedial actions are taken to address the factors impacting adversely on those attributes. This is a marked change from the approaches historically taken to track and address water quality issues per se in Scotland (as elsewhere in Europe) and for any one water body the solutions required may not always be easy to identify and/or implement effectively. As indicated above, the status of a large proportion of water bodies in Scotland was down-graded in 2007 when the new ecological status classification was implemented. One of the biggest causes of such down-grading of status revolved around changes in morphology of the water bodies<sup>41</sup>, an attribute which although potentially easy to identify in the field is one where it is not always easy (or cheap) to know how best to reinstate to the desired condition.

<sup>39</sup> This information is taken from the Scottish Government's Rural Priorities Statistics website, which when accessed in January 2010 showed the amount of Rural Priority options approved from the first five Rural Priority Advisory Committee rounds (accessed 11/01/2010) <http://www.scotland.gov.uk/Topics/farmingrural/SRDP/RuralPriorities/RuralPrioritiesStats/DataOption>

<sup>40</sup> Cao, Y., Elliott, J., McCracken, D.I., Rowe, K., Whitehead, J. and Wilson L. (2009), *Estimating the scale of future environmental land management requirements for the UK*. A report for the UK Land Use Policy Group (LUPG). ADAS UK Ltd and Scottish Agricultural College: [http://www.lupg.org.uk/pdf/LUPG\\_estimating\\_scale\\_Dec09.pdf](http://www.lupg.org.uk/pdf/LUPG_estimating_scale_Dec09.pdf)

<sup>41</sup> SEPA (2007), *An introduction to the significant water management issues in the Scotland river basin district*. Scottish Environmental Protection Agency [http://www.sepa.org.uk/about\\_us/consultations/closed\\_consultations.aspx](http://www.sepa.org.uk/about_us/consultations/closed_consultations.aspx)

As already mentioned above, SEPA and the Scottish Government have recently announced new targets of bringing 97% of Scotland's water bodies up to good status by 2027<sup>42</sup>. This is a very ambitious target, especially as this will need to be achieved while Scotland's environment is being affected by climate change (Section 5). As SEPA have highlighted<sup>43</sup>, it is not possible to consider significant water management issues without taking climate change into account: the hydrological cycle is likely to be altered by climate change; changes in the amount, timing and distribution of precipitation and run-off will lead to changes in water availability. Hence changes in the timing, intensity and duration of floods and dry spells will have environmental, social and economic consequences:



- With regard to diffuse pollution control: higher river flows in the west and north will reduce the impact of pollution in rivers, but increase loading of pollutants to the sea. This will increase the risk of the failure to achieve microbiological standards at bathing beaches and in shellfish waters. Higher intensity rainfall will increase sewer overflow rates, leading to an increase in the discharge of sewage. Lower river flows in summer in the south and east will provide less dilution for discharges, with increased sewage treatment costs. Enhanced plant/algal growth due to increased temperature will exacerbate the effects of eutrophication.
- With regard to changes to water body morphology: more frequent and severe river flooding will increase demands for flood defence schemes. There will be higher rates of river erosion where degradation of the river habitat has reduced bank protection. Increased erosion from fields will lead to siltation of fish spawning gravels and increased nutrient loading of lochs and the sea.

Hence the implementation of all WFD requirements in Scotland over the coming years will not only provide the Scottish Government, SEPA and all their partner organisations with a wide range of opportunities for collaborative actions but also with a large number of challenges.



<sup>42</sup> New targets for Scotland's water unveiled by SEPA, 17 November 2009. [http://www.sepa.org.uk/about\\_us/news/2009/new\\_targets\\_for\\_scotland%E2%80%99s\\_wat.aspx](http://www.sepa.org.uk/about_us/news/2009/new_targets_for_scotland%E2%80%99s_wat.aspx)

<sup>43</sup> SEPA (2007), *An introduction to the significant water management issues in the Scotland river basin district*. Scottish Environmental Protection Agency [http://www.sepa.org.uk/about\\_us/consultations/closed\\_consultations.aspx](http://www.sepa.org.uk/about_us/consultations/closed_consultations.aspx)



# 7. How well is farmland biodiversity being maintained?

Davy McCracken & Andrew Midgley

## Key points:

1. Data on the state of farmland biodiversity in Scotland suggest that:
  - a. a focus on designated sites and targeted actions for particular species has improved the condition of many habitats within designated areas and resulted in population increases of a number of species of high nature conservation concern.
  - b. these gains have been offset by a continuing decline in the quality of much of Scotland's wider countryside, with resulting adverse impacts on habitats and species associated with Scottish farming
  - c. Halting biodiversity loss on farmland by 2010 will therefore not be achieved fully
2. Landscape simplification is the key driver of farmland biodiversity declines but it is clear that this cannot be addressed effectively at the scale required solely by using agri-environment schemes within the Scottish Rural Development Programme (SRDP)
3. Without further major changes to the way that Common Agricultural Policy (CAP) support is targeted then Scottish farmland biodiversity is likely to continue to decline
4. Any future change in the structure of CAP funding to achieve farmland biodiversity and other environmental goals will require a robust evidence base to inform that policy change

## 7.1. Introduction



In 2006 the European Environment Agency highlighted that progress towards achieving the EU's commitment to halt biodiversity loss on farmland in Europe by 2010 was not visible and that this target was unlikely to be reached without additional integrated policy efforts<sup>1</sup>. Across Europe at that time, High Nature Value farming systems continued to be under threat from both intensification and abandonment of farm management practices, with a subsequent loss in farmland biodiversity value. Conversely, already intensified farms had generally not made the large-scale changes to their farming systems which were considered necessary to reverse the loss of habitat diversity at the landscape level and produce the conditions required to allow farmland biodiversity to recover.

In recognition of this, in 2006 the European Commission's *Biodiversity Communication*<sup>2</sup> highlighted that their strategy for halting biodiversity loss on farmland by 2010 and beyond would focus on:

- putting greater emphasis on action for the European Union's most important habitats and species through proposing, designating, protecting and managing effectively the Natura 2000 network of protected areas.
- putting greater emphasis on complementing Natura 2000 and the conservation of threatened species through also encouraging a wider countryside favourable to biodiversity.

Although the *Biodiversity Communication* placed an emphasis on taking action to address farmland biodiversity concerns (through, for example, optimising the use of agri-environment schemes and preventing intensification or abandonment of High Nature Value farming systems), the main thrust was on encouraging Member States to use existing policy and support mechanisms to help achieve this. Without such a commitment from for Member States to increase funding levels for biodiversity actions and target these more appropriately, it was anticipated that the 2010 target of halting biodiversity loss on farmland would not be achieved. In particular, the European Environment Agency expected under such a scenario that<sup>3</sup>:

- natural and semi-natural habitats would continue to be lost within intensively-farmed areas
- trends of farmland related species such as bird and butterflies would continue to decline
- High Nature Value farmland would continue to be abandoned

So how has Scottish farmland biodiversity fared over the twenty five years since the introduction of agri-environment schemes within

<sup>1</sup> EEA (2006) *Progress towards halting the loss of biodiversity by 2010*. European Environment Agency, Copenhagen [http://www.eea.europa.eu/publications/eea\\_report\\_2006\\_5](http://www.eea.europa.eu/publications/eea_report_2006_5)

<sup>2</sup> CEC (2006) *Communication from the Commission. Halting the loss of biodiversity by 2010 and beyond: sustaining ecosystem services for human well-being*. Commission of the European Communities, Brussels [http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap\\_2006.htm](http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap_2006.htm)

<sup>3</sup> EEA (2006) *Progress towards halting the loss of biodiversity by 2010*. European Environment Agency, Copenhagen [http://www.eea.europa.eu/publications/eea\\_report\\_2006\\_5](http://www.eea.europa.eu/publications/eea_report_2006_5)

the Common Agricultural Policy, fifteen years since the introduction of the Biodiversity Action Planning process (with its focus on individual Habitat and Species Action Plans) and nine years since the European Union and its constituent Member States formally declared the aim to halt biodiversity loss in Europe by 2010?

## 7.2. How has farmland biodiversity in Scotland fared to-date?

Tracking trends in farmland biodiversity is difficult given that data for only a few groups (e.g. farmland birds, butterflies) is collected on an annual basis, while data on the occurrence and condition of many habitats is collected over longer time-intervals. In addition, in many cases it is difficult to separate out from these groupings habitats or species which are wholly farmland-specific. Nevertheless, an impression can still be gained by considering what is known about the condition of sites designated specifically for their nature conservation importance and how particular populations of priority farmland species have changed over the years. The potential ecological health of the wider countryside (i.e. farmland falling outwith designated areas) can also be gauged from the results of periodic countryside surveys and a consideration of population trends across broader farmland species groups.

### 7.2.1. Trends in wider countryside habitats and features

Some of the key messages arising from the 2007 Countryside Survey<sup>4</sup> (which was funded by a consortium including Scottish Government and Scottish Natural Heritage and implemented by the Centre for Ecology & Hydrology) highlight that in Scotland plant species richness declined by c. 10% in most habitats between 1998 and 2007 after a period of relative stability between 1978 and 1998. Shade producing and shade tolerant species appear to be out-competing fast growing colonisers in disturbed habitats (such as arable). In open habitats such as grassland and heath, an increase in shade producing and shade tolerant species tends to be at the expense of low growing, uncompetitive herbs which depend on a short sward maintained by extensive grazing and low fertility.

Overall plant species richness in arable habitats has remained stable between 1990 and 2007 and there was little change in the number of farmland bird food plants and butterfly larvae food plant counts in this period (although the latter experienced a significant decline between 1990 and 1998). However, Table 1 indicates that plant species richness in improved grasslands declined by 7% between 1998 and 2007 although the number of farmland bird food plants and butterfly larvae food plants counts in this habitat stayed stable.

**Table 1. Change in the characteristics of vegetation in 200m<sup>2</sup> plots in (a) the Arable and Horticulture Broad Habitat and (b) in the Improved Grassland Broad Habitat across Scotland between 1990 and 2007, as assessed by Countryside Survey 2007<sup>5</sup>. Mean values for condition measures in 1990, 1998 and 2007 are presented. Arrows denote significant change (p<0.05) in the direction shown**

|                                    | Mean values (Scotland) |      |      | Direction of significant changes |           |
|------------------------------------|------------------------|------|------|----------------------------------|-----------|
|                                    | 1990                   | 1998 | 2007 | 1990-1998                        | 1998-2007 |
| <b>(a) Arable and Horticulture</b> |                        |      |      |                                  |           |
| Species richness                   | 10.3                   | 9.2  | 9.6  |                                  |           |
| No. bird food species              | 6.1                    | 5.4  | 5.2  |                                  |           |
| No. butterfly food species         | 3.5                    | 2.8  | 3.1  | ↓                                |           |
| <b>(b) Improved Grassland</b>      |                        |      |      |                                  |           |
| Species richness                   | 14.2                   | 14.4 | 13.2 |                                  | ↓         |
| No. bird food species              | 8.5                    | 8.5  | 8.2  |                                  |           |
| No. butterfly food species         | 7.0                    | 7.1  | 6.7  |                                  |           |

The length of managed hedges in Scotland decreased by 7% between 1998 and 2007 and only one third of managed hedges were in good structural condition in 2007 (though with signs of improving condition between 1998 and 2007). However, only 6% of managed hedges on arable land were in both good structural condition and had appropriately managed margins in Scotland in 2007. Table 2 indicates that plant species richness in hedgerow margins decreased by 22% between 1998 and 2007, which included declines in food plants of birds (22% decrease) and butterflies (21% decrease).



<sup>4</sup> Norton, L.R.; Murphy, J.; Reynolds, B.; Marks, S.; Mackey, E.C. (2009) *Countryside Survey: Scotland Results from 2007*. NERC/Centre for Ecology & Hydrology, The Scottish Government, Scottish Natural Heritage, 83pp. (CEH Project Number: C03259). [http://www.countrysidesurvey.org.uk/scots\\_reports2007.html](http://www.countrysidesurvey.org.uk/scots_reports2007.html)

<sup>5</sup> Norton, L.R.; Murphy, J.; Reynolds, B.; Marks, S.; Mackey, E.C. (2009) *Countryside Survey: Scotland Results from 2007*. NERC/Centre for Ecology & Hydrology, The Scottish Government, Scottish Natural Heritage, 83pp. (CEH Project Number: C03259) Chapter 3: "Enclosed Farmland: Arable and Horticulture and Improved Grassland Broad Habitats" <http://www.countrysidesurvey.org.uk/pdf/reports2007/scotland2007/CS-Scotland-Results2007-Chapter03.pdf>

**Table 2. Change in the characteristics of vegetation in 10m x1m Hedge Plots across Scotland between 1998 and 2007, as assessed by Countryside Survey 2007<sup>6</sup>. Mean values for condition measures in 1998 and 2007 are presented. Arrows denote significant change ( $p<0.05$ ) in the direction shown**

|                            | Mean values (Scotland) |      | Direction of significant changes |
|----------------------------|------------------------|------|----------------------------------|
|                            | 1998                   | 2007 | 1998-2007                        |
| Species richness           | 18.9                   | 14.7 | ↓                                |
| No. bird food species      | 10.1                   | 7.9  | ↓                                |
| No. butterfly food species | 8.8                    | 7.0  | ↓                                |



Good quality hedgerows like the one in this photograph are thick and bushy with well developed vegetation along the margin beside the hedgerow. This not only provides good dense cover in which birds can nest safely but also allows the hedgerow plants to flower, providing food for insects in the summer and berries in the late summer and autumn for birds and mammals. Traditionally hedges are cut back in the winter time, as this encourages thick, bushy growth from the base and prevents the hedge from becoming tall and straggly. However, hedges which are cut every year remain small and open and are not able to produce many berries in the autumn.

### 7.2.2. Condition of habitats more associated with agricultural management in protected areas

Table 3 highlights that data from Scottish Natural Heritage's Site Condition Monitoring programme suggests that 45 percent of notified grassland habitat features, 54 percent of lowland heathland habitat features and 64 percent of wetland habitat features were in either favourable or unfavourable recovering condition in 2009. This represents a marked improvement compared to the situation in 2006, when only 38 percent, 33 percent and 57 percent of those three habitat features, respectively, were assessed to be in either favourable or unfavourable recovering condition. For grasslands and lowland heath, this improvement reflects a doubling between 2006 and 2009 of the proportion of those habitats considered to be Unfavourable Recovering condition while for wetlands this reflects an almost doubling between 2006 and 2009 of the habitats considered to be in Favourable condition.

**Table 3. Condition of notified habitats in protected areas in Scotland as reported by the Scottish Natural Heritage Site Condition Monitoring programme in 2006<sup>7</sup> and 2009<sup>8</sup>. The table shows only the condition of those broad habitats expected to have a more of a direct link with agricultural management.**

| Condition                          | Grassland |      |       | Lowland Heath |      |       | Wetland |      |       |
|------------------------------------|-----------|------|-------|---------------|------|-------|---------|------|-------|
|                                    | 2006      | 2009 | Trend | 2006          | 2009 | Trend | 2006    | 2009 | Trend |
| <b>Favourable</b>                  | 31%       | 32%  | ↑     | 18%           | 16%  | ↓     | 29%     | 54%  | ↑     |
| <b>Unfavourable Recovering</b>     | 7%        | 15%  | ↑     | 15%           | 38%  | ↑     | 28%     | 10%  | ↓     |
| <b>Unfavourable</b>                | 60%       | 51%  | ↓     | 63%           | 43%  | ↓     | 43%     | 36%  | ↓     |
| <b>Partially/Totally Destroyed</b> | 2%        | 1%   | ↓     | 4%            | 3%   | ↓     | 0       | 0    |       |

### 7.2.3. Trends in farmland bird species

Trends in populations of terrestrial birds in Scotland are recorded primarily through the Breeding Bird Survey run by the British Trust for Ornithology. This scheme provides reliable population estimates which are updated annually. The sample of randomly located 1km squares enables most widespread species to be categorised to woodland, farmland or upland habitats. Figure 1 indicates that since the start of the Scottish time series in 1994 to the most recent estimate of the farmland bird index in 2007, farmland birds showed an increase of 19% overall<sup>9</sup>.

<sup>6</sup> Norton, L.R.; Murphy, J.; Reynolds, B.; Marks, S.; Mackey, E.C. (2009) *Countryside Survey: Scotland Results from 2007*. NERC/Centre for Ecology & Hydrology, The Scottish Government, Scottish Natural Heritage, 83pp. (CEH Project Number: C03259) *Chapter 5: Boundary and Linear Features Broad Habitats*  
<http://www.countrysidesurvey.org.uk/pdf/reports2007/scotland2007/CS-Scotland-Results2007-Chapter05.pdf>

<sup>7</sup> The 2006 information is taken from the 2007 data on Notified habitats in favourable conservation condition available on the SNH Trends & Indicators website: [http://gateway.snh.gov.uk/pls/htmldb\\_cagdb1/snhlive.tai\\_disp\\_template\\_pkg.display\\_main\\_page](http://gateway.snh.gov.uk/pls/htmldb_cagdb1/snhlive.tai_disp_template_pkg.display_main_page)

<sup>8</sup> The 2009 information is taken from SNH's indicator on Notified Habitats in Favourable Condition, which is based on the second round of Common Standards Monitoring and which is accessible from: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B424913.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B424913.pdf)

<sup>9</sup> This information is taken from British Trust for Ornithology Breeding Bird Survey data for Scotland and collated by SNH as part of their assessment of trends in the abundance of terrestrial breeding birds: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B394077.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B394077.pdf)



Figure 1. Data collated by Scottish Natural Heritage on the trends in the abundance of 26 breeding birds associated with farmland in Scotland between 1994 and 2007<sup>10</sup>

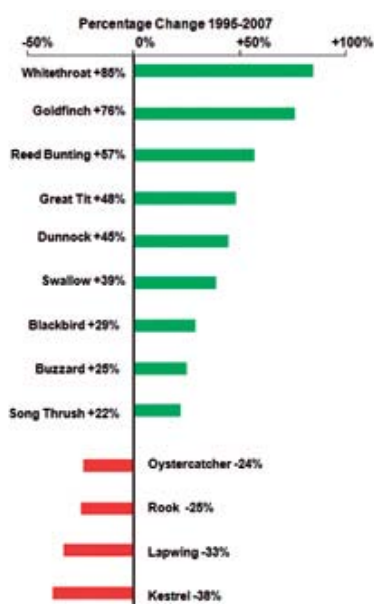
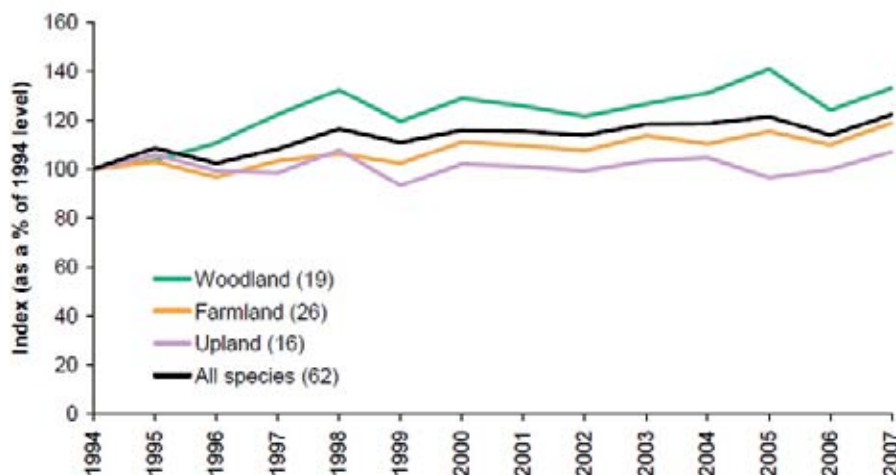


Figure 2. Population trends in farmland bird species in Scotland between 1995-2007, as assessed by the British Trust for Ornithology Breeding Bird Survey<sup>11</sup>. The trend since the start of the survey, covering 1994-2008, has been smoothed and the years end truncated. Hence the most recent trend data has been calculated for the period 1995-2007. Only farmland bird species where the trend was statistically significant are shown.

It must, however, be remembered that farmland bird populations across the UK are known to have declined significantly between the 1970s and 1980s and it is highly likely that Scottish farmland birds underwent a similar decline during that period, although trends within Scotland during that period are not reliably known. The 1994-2007 farmland bird index trend in Scotland has to be seen in this context and hence is more likely to reflect some bottoming out at relatively low population levels for some species. In addition, Figure 2 indicates that while many farmland bird species (such as goldfinch, reed bunting and swallow) increased in Scotland between 1995-2007 others just as characteristic of farmland (such as kestrel, lapwing, rook and oystercatcher) experienced significant declines during the same period.



By virtue of their scarcity or recent decline, Biodiversity Action Plan Priority Species have been the focus of concerted conservation action through Species Action Plans. The corncrake is a farmland species that has benefited from targeted action under Scottish agri-environment schemes with the result that the corncrake population in Scotland increased by 154% between 1994-2007<sup>12</sup>.

<sup>10</sup> This information is taken from the British Trust for Ornithology Breeding Bird Survey data for Scotland and collated by SNH as part of their assessment of trends in the abundance of terrestrial breeding birds: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B394077.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B394077.pdf)

<sup>11</sup> This information is extracted from the British Trust for Ornithology British Breeding Bird Survey for 2008: <http://www.bto.org/bbs/results/bbsreport.htm>

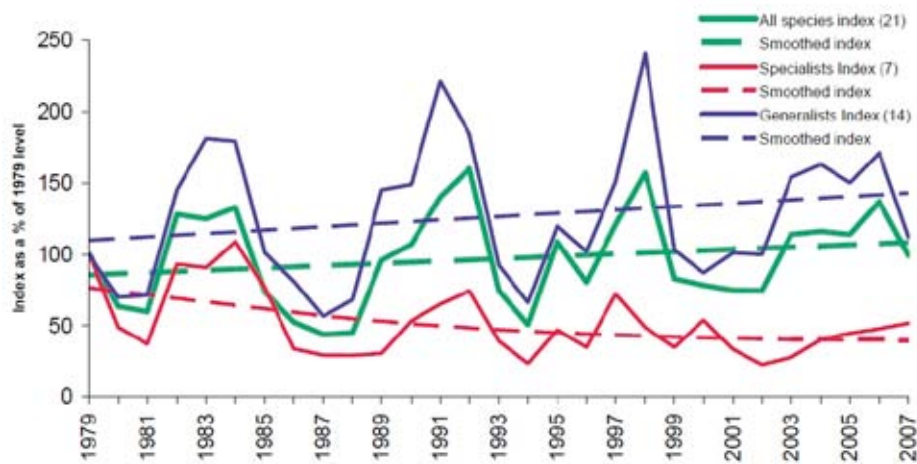
<sup>12</sup> This information is taken from British Trust for Ornithology Breeding Bird Survey data for Scotland and collated by SNH as part of their assessment of trends in the abundance of terrestrial breeding birds: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B394077.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B394077.pdf)

## 7.2.4. Trends in farmland butterfly species

Butterflies are well-documented and recognisable. The 34 species regularly recorded in Scotland can be divided into two categories: 'specialists' that are largely restricted to blocks of semi-natural habitat and 'generalists' that can utilise a broader range of habitats across the countryside. The distribution and abundance of butterflies in Scotland has been recorded since 1979, primarily from the UK Butterfly Monitoring Scheme run by Butterfly Conservation<sup>13</sup>.

Annual fluctuations of butterfly populations are largely attributable to natural environmental factors, especially weather conditions. Figure 3 illustrates that these fluctuations are a typical feature of butterfly populations and mean that despite the apparent increase in the "all species" index the overall trend is stable. Specialist species may be less able to respond positively to changes in the weather because of their lower mobility and restriction to specialist habitats that may be fragmented. Declines among specialist species have been linked to a range of factors, including land management for agriculture and forestry, habitat fragmentation and climate change. Since the late 1980s the smoothed trend for specialist species has remained relatively stable. However, from 1979 to 2007 there has been an overall significant decrease of 48%, most of which occurred during the 1980s.

**Figure 3. Butterfly distribution trends in Scotland 1979-2007 as assessed by the UK Butterfly Monitoring Scheme run by Butterfly Conservation<sup>14</sup>. The indicator includes 21 of the 34 butterfly species that occur regularly in Scotland, the remainder being excluded due to insufficient data.**



## 7.3. What are the major challenges for the future?

There are a number of key policy-oriented challenges which have contributed to the failure to address fully farmland biodiversity declines in Scotland to-date. All of these are of relevance across the European Union and hence are not necessarily Scotland-specific, although many of the policies necessary to address these challenges need to be developed and implemented within Scotland.

### 7.3.1. Biodiversity remaining a low political priority

All Member States have agri-environment schemes built into their Rural Development Programmes and have government departments/agencies charged with developing and overseeing these schemes. But generally, in most, if not all, Member States, addressing farmland biodiversity concerns is not a high government-wide policy priority and is generally overshadowed by other concerns (such as health, security or the state of the economy) which the voting public understand more easily and hence continue to push for action on more consistently. This also means that the amount of funds directed towards agri-environment schemes is generally limited and insufficient to address the scale of the actions required.

Figure 4 provides a visual representation of the anticipated spend on agri-environment measures within the lifetime of the current Scottish Rural Development Programme. Although over 70% of the total £1.6 billion budget for the period 2007-2013 has been allocated to measures for improving the environment and the countryside<sup>15</sup>, once the budgets required for Less Favoured Area Support Scheme and woodland management/creation are taken into account this leaves just over £40 million/per annum available for spending on agri-environment measures (many of which are focused on other environmental concerns, such as pollution mitigation measures, rather than specifically on actions for farmland biodiversity). While this still represents a substantial commitment to the Scottish agri-environment programme, this annual budget is much lower than the c. £250 million/per annum which a recent ADAS/SAC study has

<sup>13</sup> This indicator for Scotland is a multi-species index compiled by Butterfly Conservation and the Centre for Ecology and Hydrology, primarily from the UK Butterfly Monitoring Scheme. The indicator is collated by SNH as part of their assessment of trends in terrestrial insect abundance: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B424909.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B424909.pdf)

<sup>14</sup> This indicator for Scotland is a multi-species index compiled by Butterfly Conservation and the Centre for Ecology and Hydrology, primarily from the UK Butterfly Monitoring Scheme. The indicator is collated by SNH as part of their assessment of trends in terrestrial insect abundance: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B424909.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B424909.pdf)

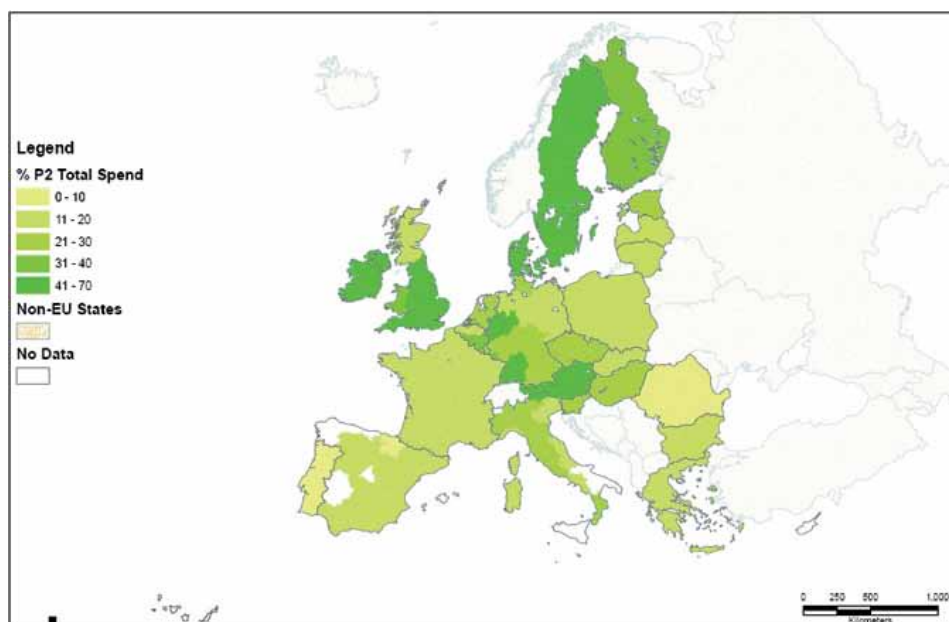
<sup>15</sup> Scotland Rural Development Programme 2007-2013 <http://www.scotland.gov.uk/Topics/farmingrural/SRDP>

estimated would be required to address biodiversity concerns effectively in Scotland<sup>16</sup>. Indeed, as Figure 5 produced by the Institute for Environmental Policy illustrates, Scotland has allocated a much lower proportion of its overall anticipated RDP spend to agri-environment measures per se when compared to other Member States such as Austria, England, Denmark, Finland and Sweden.

**Figure 4. Anticipated SRDP and Pillar I total spend in Scotland 2007-2013. The relevant proportion of agri-environment budget within the SRDP total is shown together with an indication at the same scale of the spend available over the same period for Single Farm Payment (receipt of which is subject to farmers meeting basic environmental conditions)**



**Figure 5. Geographical variation in agri-environment expenditure across the EU 27 Member States, as assessed by the Institute of European Environmental Policy in 2008<sup>17</sup>. The map shows anticipated agri-environment expenditure as a percentage of overall Pillar 2 funding (EAFRD plus co-financing) over the lifetime of each 2007-2013 Rural Development Programme.**



### 7.3.2. Relying on farmers to engage voluntarily in agri-environment schemes

Although it is mandatory for every Member State to offer agri-environment schemes, it is not mandatory for farmers and land-managers to participate in such schemes. Hence Member States are relying on farmers wanting to engage voluntarily in agri-environment schemes but in a situation where there is no sanction faced by the farmers/land-managers if they choose not to engage. It can therefore be difficult to ensure that sufficient farmers and land-managers become actively engaged in working to halt biodiversity loss.

The reduction (modulation) of the historic level of production-oriented subsidy payments and the use of those modulated funds to provide the budget for what is known as Pillar 2 of the CAP, does now mean that most farmers need to engage with their Member State's Rural Development Programme (RDP) funded under Pillar 2 if they do not want their overall payment levels to decrease. However, Rural Development Programmes contain a wide range of activities, and farmers therefore do not necessarily have to look specifically to biodiversity options within agri-environment schemes in order to try and recoup the modulated funds. For example, Table 4 shows the ten Scottish RDP Rural Priority options to which the most amount of funding had been committed after the first five rounds of applications across Scotland. Of the overall amount of funding committed to these ten options, less than 50 percent concerned options

<sup>16</sup> Cao, Y., Elliott, J., McCracken, D.I., Rowe, K., Whitehead, J. and Wilson L. (2009) *Estimating the scale of future environmental land management requirements for the UK*. A report for the UK Land Use Policy Group (LUPG). ADAS UK Ltd and Scottish Agricultural College: [http://www.lupg.org.uk/pdf/LUPG\\_estimating\\_scale\\_Dec09.pdf](http://www.lupg.org.uk/pdf/LUPG_estimating_scale_Dec09.pdf)

<sup>17</sup> Farmer, M., Cooper, T., Swales, V. & Silcock, P. (2008). *Funding for farmland biodiversity in the EU: gaining evidence for the EU budget review*. A report for the RSPB by Institute for European Environmental Policy and Cumulus Consultants: [http://www.ieep.eu/publications/pdfs/IEEP%20\(2008\)%20Funding%20for%20Farmland%20Biodiversity%20in%20the%20EU%20Final.pdf](http://www.ieep.eu/publications/pdfs/IEEP%20(2008)%20Funding%20for%20Farmland%20Biodiversity%20in%20the%20EU%20Final.pdf)



specifically involving some form of actions with direct or (in the case of the woodland creation options) potentially indirect anticipated biodiversity benefits. Even when the overall total amount of funds committed across all 126 options available within the SRDP is taken into account, the commitment to options with a direct or potentially indirect biodiversity benefit still only amounts to just over 50 percent of that total commitment across the lifetime of the SRDP.

**Table 4. The ten SRDP Rural Priority options to which the most amount of funding had been committed after the first five rounds of consideration of applications across Scotland <sup>18</sup>**

| Ranking based on funds committed   | Option Description                                     | Cases with Option | Total amount of funds committed |
|--|--|-------------------|---------------------------------|
| 1  | Restructuring agricultural businesses                  | 384               | £27,888,619                     |
| 2  | Hedgerows - 3 years for biodiversity benefits          | 639               | £12,849,233                     |
| 3  | Open Grazed or Wet Grassland for Wildlife              | 740               | £12,177,236                     |
| 4  | Diversification Outwith Agriculture                    | 99                | £10,772,188                     |
| 5  | Woodland creation - Native woodland planting           | 216               | £6,986,988                      |
| 6  | Development/Creation Of Micro-Enterprises              | 35                | £6,026,888                      |
| 7  | Manure/slurry storage and treatment - manure storage   | 128               | £5,976,960                      |
| 8  | Mown Grassland for Wildlife                            | 442               | £5,620,018                      |
| 9  | Community services and facilities                      | 25                | £5,008,120                      |
| 10   | Woodland creation - Mixed conifer/broadleaved woodland | 78                | £3,777,159                      |
| Total amount of funds committed to these top 10 options:                         |  |                   | £97,083,409                     |
| Total amount of funds committed to options ranked 2, 3, 5, 8 & 10:               |  |                   | £41,410,634                     |
| Overall total amount of funds committed to all 126 available options:            |  |                   | £157,375,157                    |
| Overall total amount of funds committed to all options with a biodiversity focus |  |                   | £81,732,714                     |

### 7.3.3. Achieving effective targeting of biodiversity actions

Due to the dominance of agriculture in European land use, farmland biodiversity concerns cover a very wide range of habitats and species. To date much of the effort of agri-environment schemes has been focused on actions aimed at particular habitats or species, largely driven by the Biodiversity Action Plan process. This variety in itself can lead to potential conflicts where the management requirements for one species may be completely different from those of another. In addition, most agri-environment actions are targeted at the level of an individual field (or part of a field) or at best at the level of an individual farm. But there is little or no consideration of what is being done on neighbouring farms when considering what actions to develop on any one farm. Farmland biodiversity is influenced by what is happening in its immediate surroundings, but also by what is happening at the farm and wider landscape scale. Hence trying to address farmland biodiversity concerns through influencing the management of only part of one farm is generally not going to be sufficient enough of a change to make a big enough difference on the ground. The Scottish RDP does provide the opportunity for farmers and land-managers to make collaborative applications but more applicants could be making use of this avenue to address biodiversity concerns at an appropriate scale on the ground.

Within the Scottish RDP there is the potential for increasing conflicts over where best to target agri-environment funding. For example, historically in Scotland, agri-environment schemes were directed at farms in the wider countryside while farmers with some form of nature conservation designation on their land could obtain separate funding (in the form of a specifically negotiated management agreement) to help offset the costs of management required on the designated areas to keep the area in favourable conservation condition. Now, however, funds for wider countryside and protected area management sit within the same pot within the current Scottish RDP. This means that any farmers with a protected area management agreement which is coming to an end now has to apply to the (currently resource limited) agri-environment scheme. It also means that any agri-environment application which involves a protected area designation is likely to be given higher priority for funding over one from a farm in the wider countryside. This raises the wider question of how relatively limited agri-environment funds should be used to best effect in Scotland, e.g. should agri-environment funding be directed at enhancing the biodiversity of intensive agricultural landscapes where the existing biodiversity value is low or should such funding be directed at the more extensive agricultural landscapes where biodiversity value is still high?

### 7.3.4. Identifying and supporting High Nature Value farming systems

Within their RDPs, all Member States are tasked with ensuring that the Axis 2 (Sustainable Land Management) elements are targeted at "...biodiversity and preservation of high nature value farming and forestry systems, water and climate change". This clear emphasis on HNV farming is welcome as is the work going on across Europe to identify how much, and where, HNV farming occurs. But identifying a baseline and developing mechanisms to track trends in the HNV farming resource is only some of what is required of Member States. There is also a requirement to support and maintain HNV farming through the RDPs and to do so effectively will mean directing additional funds to HNV farms. These additional funds will, however, need to come from elsewhere within the CAP's Pillar 1 and Pillar 2 budget. This will mean that in order for HNV farming to gain, other areas of agriculture will lose. There is therefore a conflict in the

<sup>18</sup> This information is taken from the Scottish Government's Rural Priorities Statistics website, which when accessed in January 2010 showed the amount of Rural Priority options approved from the first five Rural Priority Advisory Committee rounds (accessed 11/01/2010) <http://www.scotland.gov.uk/Topics/farmingrural/SRDP/RuralPriorities/RuralPrioritiesStats/DataOption>

making given the likelihood that the more intensive farmers across Europe are likely to be reluctant to see their CAP payments being eroded any further.

## In Focus: Identifying and supporting Scottish High Nature Value farming systems

The High Nature Value (HNV) farming concept recognises that many European habitats and landscapes considered to be of high nature conservation value are intimately associated with the continuation of specific low-intensity farming systems. The underlying principles behind the development of the HNV farming concept were, and remain, that:

- Market, agricultural policy and social pressures are increasingly making such HNV farming systems economically unviable
- Any resulting intensification or abandonment of such farming systems would adversely impact on the associated HNV
- There is therefore a justifiable case to be made for directing additional financial support to these farming systems to help maintain the HNV

A large proportion of Scotland's farming systems, especially those grazing systems practised on the islands and the hills and uplands, are potentially of High Nature Value. Implementing HNV requirements through the Scottish RDP potentially provides an opportunity to direct additional financial support towards HNV farming systems which are now known to be under greater threat following the European-wide changes to Common Agricultural Policy support mechanisms implemented in 2005.

There is a need not only to establish a baseline of how much HNV farming occurs in Scotland but also to develop mechanisms to track trends in that HNV farming resource within the life-span of the Scottish RDP. There is also a further important need to consider what types of HNV farming-specific support mechanisms are required in Scotland and what policy framework is needed to ensure that such support can be developed and implemented effectively.

The Scottish Government (together with Forestry Commission Scotland, RSPB Scotland, SAC, Scottish Natural Heritage and others) are currently working to this end and considering how best to identify how much, and where, HNV farming and forestry systems occur in Scotland.

### 7.4. How well is farmland biodiversity being maintained?

An increased focus on designated sites and targeted actions for particular species in Scotland has reaped rewards in recent years in terms of improving the condition of many designated habitats and markedly increasing the Scottish populations of a number of species of high nature conservation concern. However, this has been offset by a continuing decline in the quality of much of Scotland's wider countryside, with resulting adverse impacts on many other habitats and species associated with Scottish farming systems.

Hence in Scotland, as in the rest of the EU, it is clear that halting biodiversity loss on farmland by 2010 will not be achieved fully. It is also clear that despite the inclusion of a wide range of actions for farmland biodiversity within the Scottish RDP, without further major changes to the way that CAP and agri-environment support is targeted then Scottish farmland biodiversity is likely to continue to decline. For example, nature conservation designations alone are likely to cover only a minority of Scotland's existing extent of HNV farming systems. In addition, not only is the level of funds currently available in Pillar 2 of the CAP (the main funding route to support biodiversity-oriented actions on farms) unlikely to increase markedly, but also the focus on other environmental concerns is likely to reduce even further the potential of these already limited funds<sup>19 20</sup> to achieve effective biodiversity gains.

Scottish farmers, their farming systems and individual farming practices are needed to maintain and improve conditions for habitats and species of farmland biodiversity concern. However, as a recently report for the Scottish Government has highlighted, the land-use drivers which currently impact most on land managers are CAP-based policy instruments, such as the Less Favoured Areas Support Scheme, the Single Farm Payment and Agri-Environment Measures. The latter two support mechanisms are expected to continue in some form after 2013 (when the next rural development programming period starts), and hence are expected to continue to be major drivers of agricultural land use decisions in Scotland until at least 2019<sup>21</sup>.

<sup>19</sup> Cao, Y., Elliott, J., McCracken, D.I., Rowe, K., Whitehead, J. and Wilson L. (2009) *Estimating the scale of future environmental land management requirements for the UK*. A report for the UK Land Use Policy Group (LUPG). ADAS UK Ltd and Scottish Agricultural College: [http://www.lupg.org.uk/pdf/LUPG\\_estimating\\_scale\\_Dec09.pdf](http://www.lupg.org.uk/pdf/LUPG_estimating_scale_Dec09.pdf)

<sup>20</sup> Farmer, M, Cooper, T., Swales, V. & Silcock, P. (2008). *Funding for farmland biodiversity in the EU: gaining evidence for the EU budget review*. A report for the RSPB by Institute for European Environmental Policy and Cumulus Consultants: [http://www.ieep.eu/publications/pdfs//IEEP%20\(2008\)%20Funding%20for%20Farmland%20Biodiversity%20in%20the%20EU%20Final.pdf](http://www.ieep.eu/publications/pdfs//IEEP%20(2008)%20Funding%20for%20Farmland%20Biodiversity%20in%20the%20EU%20Final.pdf)

<sup>21</sup> Miller, D., Schwarz, G., Sutherland, L-A., Morrice, J., Aspinall, R., Barnes, A., Blackstock, K., Buchan, K., Donnelly, D., Hawes, C., McCrum, G., McKenzie, B., Matthews, K., Miller, D., Renwick, A., Smith, M., Squire, G. & Toma, L. (2009). *Changing land use in rural Scotland: drivers and decision makers. Rural Land Use study Project 1*. Report for the Scottish Government by The Macaulay Land Use Research Institute, Forest Research, Humboldt University of Berlin, Scottish Agricultural College and Scottish Crop Research Institute [www.scotland.gov.uk/Resource/Doc/294685/0091117.pdf](http://www.scotland.gov.uk/Resource/Doc/294685/0091117.pdf)

Therefore the amount of income that farmers can obtain from the CAP and market sources will continue to drive farm management decisions and the overall viability of each farm for at least the next ten years. Hence, without a major restructuring of the levels of support available for biodiversity actions then the overall amount of income obtainable from Scottish HNV livestock grazing systems is likely to remain low and such farmers will continue to be under pressure to either intensify (to increase overall income levels) or abandon farming practices altogether (to reduce their overall costs and maximise the level of support payments they retain as income). Conversely, on the more intensive, and hence biodiversity poor, grassland and arable farming systems, a greater proportion of income coming from agricultural production is likely to decrease willingness to release productive areas of farmland to implement biodiversity actions. Hence the marked increases in habitat and landscape diversity which is required to increase biodiversity in and around such farms is unlikely to occur<sup>22</sup>.

## 7.5 What more could be done?

Landscape simplification is the key driver of farmland biodiversity declines<sup>23</sup> but it is also clear that this currently cannot be addressed at the scale required solely by using agri-environment schemes within the SRDP<sup>24</sup>. Indeed a recently published study has highlighted that there was no conclusive evidence of previous Scottish agri-environment schemes having a positive impact on bird populations on farms after the farmers joined the scheme, either in terms of the rate of change in bird numbers (or number of species) or in the nature of the changes over time<sup>25</sup>.

It is likely that the successor to the CAP could differ markedly from the current approach (especially with regard to its aims, levels of support and the management requirements put on the eligibility to receive support<sup>26</sup>) but that does not necessarily mean that funding for biodiversity actions per se would be increased markedly post-2013. In any case, waiting another three years before seeking more appropriate ways to address farmland biodiversity concerns would simply result in further declines in the quality Scotland's wider countryside.

Landscape simplification could potentially be addressed now, and the available limited Pillar 2 funds used more effectively, if all farmers were required to do more than simply maintain their farmland in Good Agricultural & Environmental Condition (GAEC) in order to qualify for Pillar 1 support<sup>27</sup>. In this way, the onus would be put on all farmers to achieve a minimum level of appropriate habitat diversity and/or management at the farm and wider landscape scale in order to qualify for their single farm payment. Such an approach would potentially increase the general underlying biodiversity value of the more intensified farmland and increase the probability of any additional agri-environment actions within those areas achieving their biodiversity goals. It could also mean that funds would be available to implement additional HNV farming-specific support measures, without which Scotland's HNV farming systems, and their associated biodiversity value, are unlikely to survive into the future.

The recent proposed changes to current Scottish Cross Compliance conditions under the CAP Health Check are therefore a step in the right direction (especially with regard to enhancing protection of watercourses and increasing the amount of field margin habitats potentially available to wildlife). However, there is a justification for these conditions to be extended further (e.g. by giving increasing protection to hedgerows and ensuring that they and associated margins are managed in an appropriate manner), in order to help achieve the Scottish Government and EU goal to halt and reverse farmland biodiversity declines in both designated areas and the wider countryside.

Looking to the situation post-2013, the way agri-environment schemes are funded could also be changed to increase the cost-effectiveness of such biodiversity actions on the ground. Currently, these schemes tend to be action-based, i.e. they offer payments for adherence to management prescriptions that are assumed to deliver environmental benefits, rather than making payments conditional on realisation of the benefits themselves. This prescription-based approach is a pragmatic response to the measurement and monitoring problems associated with many environmental benefits which can be difficult to identify, value and ascribe to causal factors with total certainty. However, payment-for-actions can lead to economic inefficiencies. As a result, the potential for payment-by-results as an alternative approach is generating increased international interest under a variety of different names. A recent study has suggested a set of generic principles for the implementation of payment-by-result schemes and considered their potential applications at habitat or wider landscape scale<sup>28</sup>.

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<sup>22</sup> McCracken, D. & Klockenbring, C. (2007). *Overview of the selection of biodiversity technical measures*. MEACAP: Impact of Environmental Agreements on the CAP Project WP5 Final Report. 90 pp. DG Research Specific Targeted Research Project SSPE-CT-2004-503604 <http://www.ieep.eu/projectminisites/meacap/index.php>

<sup>23</sup> Henle, K., Alard, A., Clitherow, J., Cobb, P., Firbank, L., Kull, T., McCracken, D.I., Moritz, R., Mühle, H., Niemelä, J., Nowicki, P., Rebane, M., Wascher, D., Watt, A. & Young, J. (2008) Identifying and managing the conflicts between agriculture and biodiversity conservation in Europe:- a review. *Agriculture, Ecosystems & Environment* 124, 60-71

<sup>24</sup> Cao, Y., Elliott, J., McCracken, D.I., Rowe, K., Whitehead, J. and Wilson L. (2009) *Estimating the scale of future environmental land management requirements for the UK*. A report for the UK Land Use Policy Group (LUPG). ADAS UK Ltd and Scottish Agricultural College: [http://www.lupg.org.uk/pdf/LUPG\\_estimating\\_scale\\_Dec09.pdf](http://www.lupg.org.uk/pdf/LUPG_estimating_scale_Dec09.pdf)

<sup>25</sup> Parish, D., Hirst, D., Dadds, N., Brian, S., Manley W., Smith G. & Glendinning, B. (2009) *Monitoring and evaluation of agri-environment schemes*. Report to Scottish Government <http://www.scotland.gov.uk/Resource/Doc/289188/0088491.pdf>

<sup>26</sup> Miller, D., Schwarz, G., Sutherland, L-A., Morrice, J., Aspinall, R., Barnes, A., Blackstock, K., Buchan, K., Donnelly, D., Hawes, C., McCrum, G., McKenzie, B., Matthews, K., Miller, D., Renwick, A., Smith, M., Squire, G. & Toma, L. (2009) *Changing land use in rural Scotland: drivers and decision makers. Rural Land Use study Project 1*. Report for the Scottish Government by The Macaulay Land Use Research Institute, Forest Research, Humboldt University of Berlin, Scottish Agricultural College and Scottish Crop Research Institute [www.scotland.gov.uk/Resource/Doc/294685/0091117.pdf](http://www.scotland.gov.uk/Resource/Doc/294685/0091117.pdf)

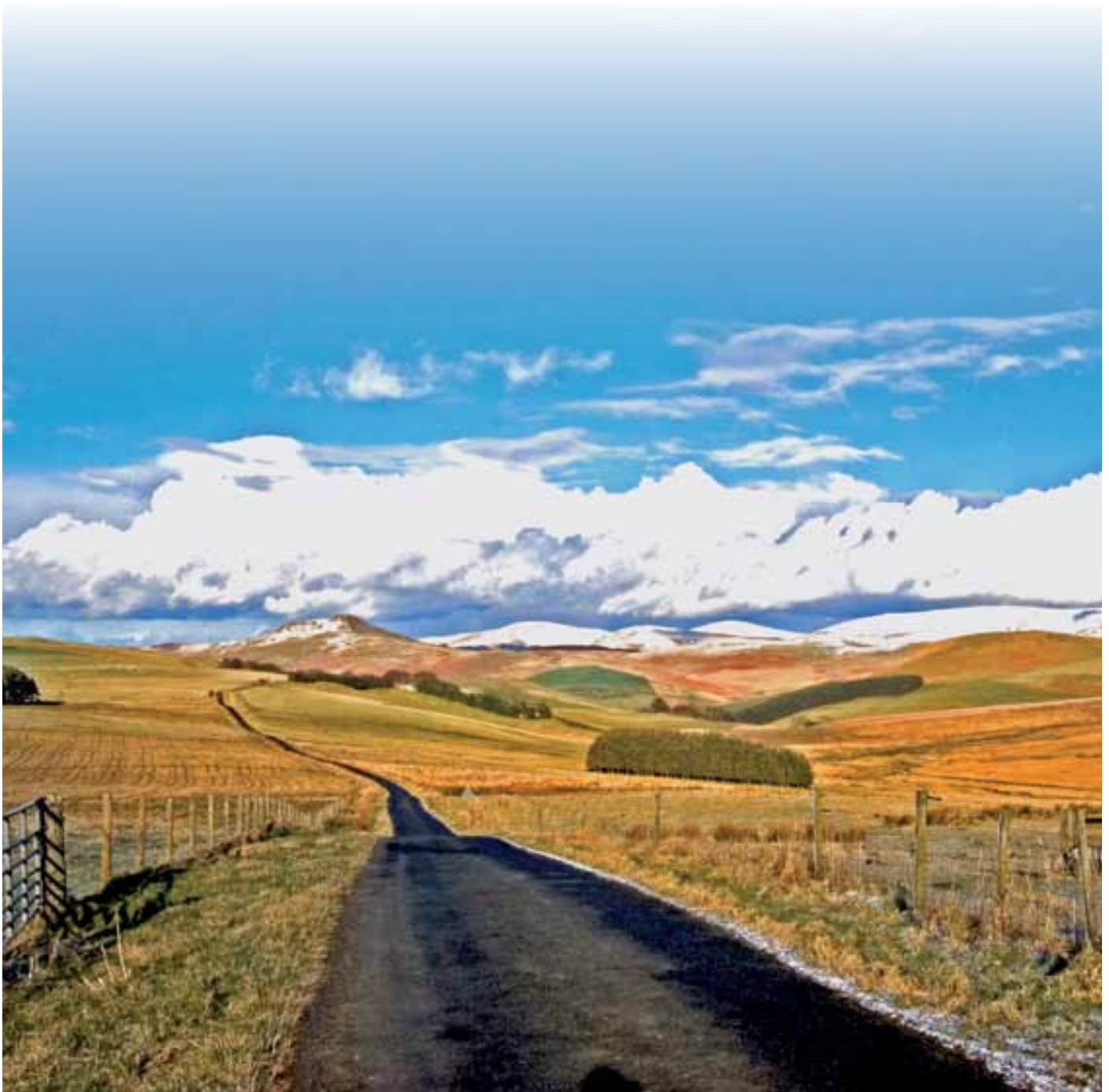
<sup>27</sup> Scotland Rural Development Programme 2007-2013 <http://www.scotland.gov.uk/Topics/farmingrural/SRDP>

<sup>28</sup> Schwarz, G., Moxey, A., McCracken, D., Huband, S. & Cummins, R. (2008) *An analysis of the potential effectiveness of a Payment-by-Results approach to the delivery of environmental public goods and services supplied by Agri-Environment Schemes (23192)*. Report to the UK Land Use Policy Group (LUPG). Macaulay Institute, Pareto Consulting and Scottish Agricultural College [http://www.lupg.org.uk/pdf/LUPG\\_Payment\\_by\\_Results\\_Feb09.pdf](http://www.lupg.org.uk/pdf/LUPG_Payment_by_Results_Feb09.pdf)



It is evident from the above sections that in Scotland, as elsewhere in Europe, concern about farmland biodiversity declines has raised questions not only about how biodiversity actions on farmland can be better targeted but also about how this can be best achieved and funded. In addition to any payments for environmental enhancement, there is also an associated need for efficient and effective regulation to ensure that Scotland's biodiversity is not degraded through agricultural production (or in the case of farming's current retreat from the Scottish hills, the lack of it<sup>29</sup>). Hence, any changes to Cross-Compliance conditions will only be effective drivers of positive land-use change if these are backed-up by appropriate monitoring and enforcement of those conditions.

However, any future change in the structure of the funding for achieving farmland biodiversity goals will require a robust evidence base to inform that policy change<sup>30</sup>. If there is an aspiration to increase cross compliance conditions within Pillar 1 of the CAP, to provide additional funds for agri-environment schemes by transferring funds from Pillar 1 to Pillar 2 or to introduce payment-by-results agri-environment schemes, it will be essential to know how well cross compliance is currently delivering environmental benefits, whether Pillar 1 is achieving its objectives, what the impact of Pillar 1 withdrawal would be, what benefits enhanced Pillar 2 funding might deliver and how cost-effective payment-by-results agri-environment schemes would be. Recent work by ADAS, SAC and RPS has examined the impact of Pillar I reform in England on many of these issues and similar work would help inform the debate in Scotland<sup>31</sup>.



<sup>29</sup> SAC (2008) *Farming's retreat from the hills*. Edinburgh: Scottish Agricultural College. <http://www.sac.ac.uk/mainrep/pdfs/retreatreport.pdf>

<sup>30</sup> SAC (2009). *Inquiry into Future Support for Agriculture in Scotland – call for evidence*. Scottish Agricultural College response to Scottish Government <http://www.sac.ac.uk/mainrep/pdfs/inquiriesacresponse>

<sup>31</sup> ADAS, SAC & RPA (2008) *Estimating the environmental impact of Pillar 1 and the potential implication for Axis II funding*. Report prepared for Defra and Natural England <https://statistics.defra.gov.uk/esg/reports/Impacts%20of%20Pillar%20I%20Reform%20Final%20Report.pdf>

# 8. What future for upland biodiversity?

Andrew Midgley and Martin Price<sup>1</sup>

## Key points:

1. Data on the state of upland biodiversity suggest that:
  - a. the extent of different habitats is not changing significantly, although the composition of some habitats is.
  - b. 58% of notified habitats in upland protected areas are in a 'favourable' or 'unfavourable recovering' condition.
  - c. the abundance of upland breeding birds increased by 7% between 1994 and 2007.
2. Upland biodiversity is currently facing pressures from climate change and changing land management.
3. An important issue for the future of upland biodiversity revolves around the question of how best to secure favourable land management, with one option being to pay land managers for the provision of 'public goods'.
4. Biodiversity in the uplands cannot be considered in isolation; the future of upland biodiversity is intimately connected with wider issues about the sustainability of upland land use and of remote rural communities.
5. A coherent policy approach to the future of the uplands is needed.
6. There is often a lack of necessary data to support decision-making, to target policy effectively and to monitor impact.

## 8.1. Introduction

The Scottish uplands are important for their biodiversity<sup>2</sup>. They include many habitats and species that are of national, European and international importance, and they provide a diverse range of goods and services. As a consequence, the uplands are highly protected with many designated sites, yet the future of upland biodiversity is not necessarily secure.

Upland biodiversity faces a series of new and evolving pressures. The uplands, for example, support a range of land-based industries such as farming, forestry, renewable energy, field sports, tourism and recreation, and change in these industries can have significant implications for biodiversity. Farming in the uplands is currently challenging, and many land managers are changing their farming practices, with potential impacts on biodiversity. Similarly, climate change is likely to have an effect on many species and habitats, and our response through the development of renewable energy projects and changing land management is also likely to have a large short-term impact.

Assessing the future of upland biodiversity is therefore complex. It cannot simply be about protection in designated sites, given both the scale of the uplands and the fact that much upland biodiversity survives because of the ways the uplands have been managed by land managers (even though much past exploitation has led to the loss of biodiversity). The future of upland biodiversity is therefore closely linked to the degree to which we can achieve sustainable land management and sustainable rural communities<sup>3</sup>. In this chapter, we focus on upland biodiversity as a means of exploring some of the current and emerging issues in upland land management.

## 8.2. What is happening to upland biodiversity today?

Since the uplands account for such a large proportion of Scotland's area, with many parts of the uplands being rather inaccessible, information on upland biodiversity is less than comprehensive. The best source of information at present, giving an overview of the trends of habitat status, is the Countryside Survey, which records a wide range of data, notably on the extent and condition of habitats<sup>4</sup>. Data from the latest survey suggest that, while there have not been significant changes in the extent of different upland habitats across Scotland between 1998 and 2007, changes are taking place in specific regions or over longer timescales. For example, the area of Bracken Broad Habitat in the Intermediate Uplands and Islands increased by 27% between 1998 and 2007.

Complementary data from the Countryside Survey on the composition of habitats suggest that, while the *extent* of habitats is not changing significantly across Scotland, subtle changes are taking place *within* individual habitats. In Dwarf Shrub Heath and Bog Broad Habitats, for example, the cover of grass species relative to herbaceous flowering plants increased between 1998 and 2007, suggesting a deterioration in the condition of these habitats. There has also been a decline in species richness in several habitats. From 1990 to 2007, there was a decrease of 12% in the mean Species Richness Score in the Dwarf Shrub Heath Broad Habitat from 20.3 to 17.8 plant species per plot. Between 1998 and 2007, mean plant species richness also decreased in Fen, Marsh and Swamp Broad Habitat (by 23%) and in the Bog Broad Habitat (by 11%).

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<sup>2</sup> The 'uplands' of Scotland can be defined in a variety of ways. Common approaches include defining the uplands as land above agricultural enclosure or as synonymous with Less Favoured Area. Here uplands are taken in a general sense to include mountain and moorland, farmed land in hill areas and forestry.

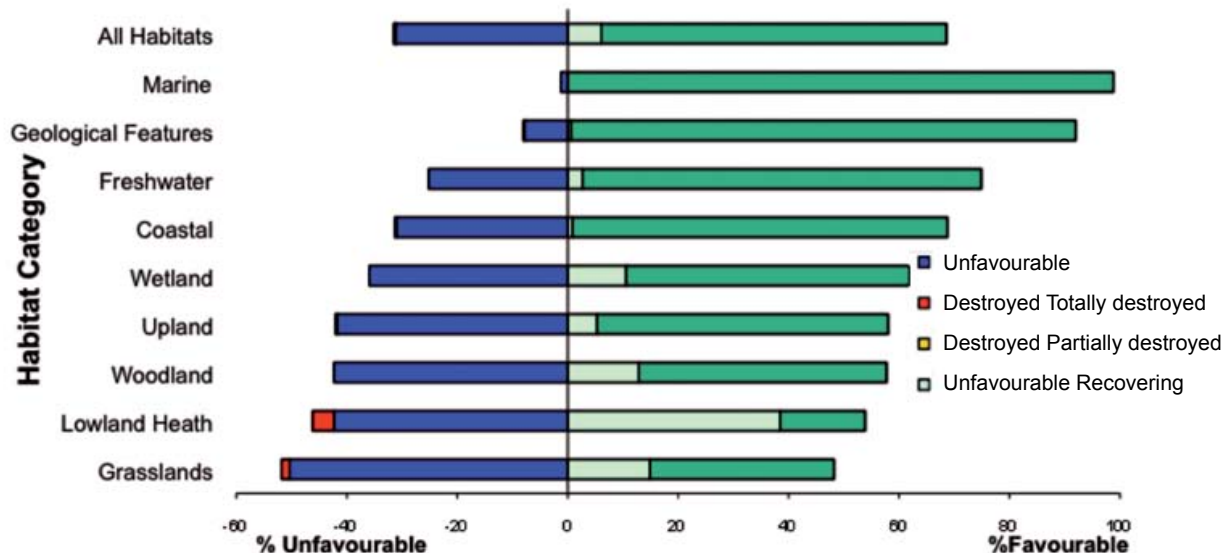
<sup>3</sup> See SNH, (2002), *Natural Heritage Futures: Hills and Moors*, [http://www.snh.org.uk/futures/Data/pdfdocs/Hills\\_and\\_Moors.pdf](http://www.snh.org.uk/futures/Data/pdfdocs/Hills_and_Moors.pdf) and SNH, (2009), *Natural Heritage Futures: Hills and Moors Update* <http://www.snh.org.uk/pdfs/strategy/nhfupdate2009/HillsMoors.pdf>.

<sup>4</sup> Norton, L.R.; Murphy, J.; Reynolds, B.; Marks, S.; Mackey, E.C. (2009) *Countryside Survey: Scotland Results from 2007*. NERC/Centre for Ecology & Hydrology, The Scottish Government, Scottish Natural Heritage, 83pp. (CEH Project Number: C03259). <http://www.countryside-survey.org.uk/pdf/reports2007/scotland2007/CS-Scotland-Results2007-Chapter07.pdf>.

These findings are reinforced by recent research that examined change in Scottish alpine vegetation<sup>5</sup>. Using data collected between 1963 and 1987 as a baseline to assess biodiversity change across a range of habitats, researchers from the Macaulay Institute have been able to assess change over a 20–40 year period and identify a homogenisation of Scottish alpine vegetation. They found that although alpine habitats have been predicted to show considerable resistance to change, they may in fact change in both richness and composition over relatively short timescales. The findings suggest that while key northern and alpine species have declined, lowland generalist species have increased.

Another indication of the state of upland habitats is available from data on the condition of features in designated sites. Scottish Natural Heritage works with owners and occupiers of designated sites to secure sympathetic management. To effectively monitor the outcome of that management they have put in place a common system to assess the status of designated features. The latest data from this 'Site Condition Monitoring' process suggests that 58% of notified upland habitats were in a favourable or unfavourable recovering condition, with 42% recorded as unfavourable (figure 1).

**Figure 1: Condition of notified habitats in protected areas, 2009<sup>6</sup>**



Further information on the state of upland biodiversity comes from data collected as part of the UK Biodiversity Action Plan (UKBAP) 2008 reporting round. As part of the UK's response to the Convention on Biological Diversity, action plans for priority habitats have been written and act as a focal point for conservation activity. Every three years key conservation professionals report on the state of priority habitats and, although there are significant difficulties in making this sort of assessment (not least because of limited data collection), the reported trends (table 1) provide insight into how conservationists view the status of key upland Biodiversity Action Plan habitats. These assessments suggest that the woodland habitats are increasing while the bog and grassland habitats are declining.

**Table 1: Trends for Biodiversity Action Plan upland priority habitats<sup>7</sup>**

| Habitat name                        | Trend               | Accuracy              | Date |
|-------------------------------------|---------------------|-----------------------|------|
| Blanket bog                         | Declining (slowing) | Partial survey        | 2005 |
| Limestone Pavements                 | Stable              | Partial survey        | 2008 |
| Native pine woodlands               | Increasing          | Partial survey        | 2008 |
| Purple moor grass and rush pastures | Declining (slowing) | Best guess            | 2008 |
| Upland calcareous grassland         | Declining (slowing) | Partial survey        | 2008 |
| Upland hay meadows                  | Declining (slowing) | Best guess            | 2008 |
| Upland heathland                    | Declining (slowing) | Sample or full survey | 2007 |
| Upland mixed ashwoods               | Increasing          | Best guess            | 2008 |
| Upland oakwood                      | Increasing          | Best guess            | 2008 |

<sup>5</sup> Britton, A.J.; Beale, C.; Towers, W.; Hewison, R.L., 2009, Biodiversity gains and losses: evidence for homogenisation of Scottish alpine vegetation, *Biological Conservation*, 142, 1728-1739.

<sup>6</sup> This information is taken from SNH's indicator on Notified Habitats in Favourable Condition, which is based on the second round of Common Standards Monitoring: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B424913.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B424913.pdf).

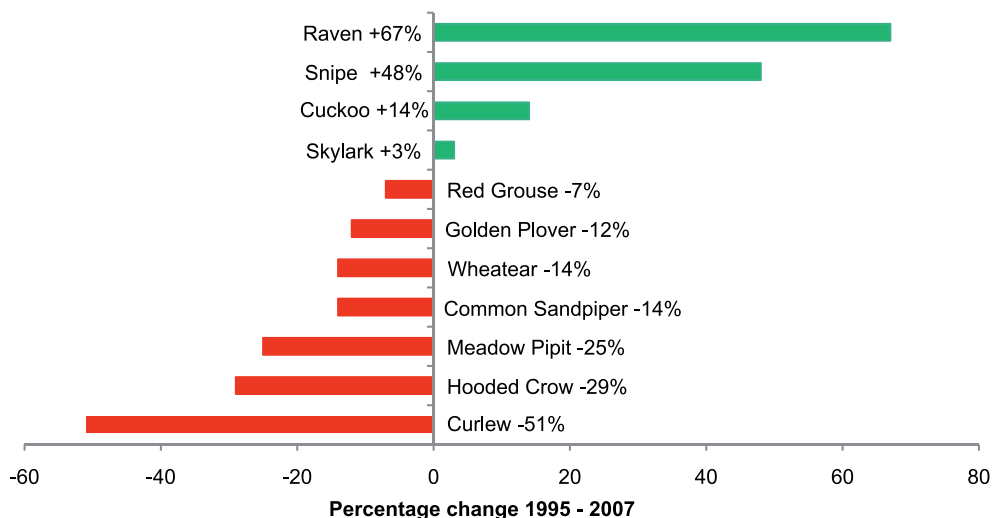
<sup>7</sup> These data were generated in the 2008 UKBAP Reporting Round. Lead Partners (the people responsible for overseeing action undertaken as part of each biodiversity action plan) were asked to provide an assessment on the basis of the best available data of the trends. The data can be accessed on the Biodiversity Action Reporting System website: <http://www.ukbap-reporting.org.uk/status/uk.asp>.



In addition to this information on upland habitats, data are available on particular groups of species. Headline indicators suggest that the abundance of upland breeding birds, for example, increased by 7% between 1994 and 2007<sup>8</sup>. This is a positive trend, but must be understood in context, as this increase is modest in comparison to an increase of 33% in woodland and 19% on farmland. Further, it is a trend that masks variation amongst upland species. For example, between 1994 and 2007, black grouse and peregrine declined by 35% and 14% respectively, while the hen harrier increased by 66%.

The latest data from the British Trust for Ornithology Breeding Bird Survey, which provides an assessment of trends between 1995 and 2007, also highlights the variation among upland species (figure 2). Some species have done very well, such as raven (+67%) and snipe (+48%), while others have declined, such as the Wheatear (-14%), meadow pipit (-25%) and curlew (-51%)<sup>9</sup>.

**Figure 2: Population trends in upland bird species in Scotland between 1995-2007, as assessed by the British Trust for Ornithology Breeding Bird Survey.**



So, what is the state of upland biodiversity today? Taken as a whole, the data at the broadest level are equivocal. The upland birds indicator is on a positive trend, but this must be understood in the context of the long-term decline of many species. The long-term data on alpine plants show a mixed picture, but overall the vegetation has become more homogenous and the species most characteristic of the uplands have declined. The data on the condition of features in designated sites suggests that the majority are in favourable or unfavourable recovering condition. Yet 42% remain in unfavourable condition and we must remember that these are meant to be the special sites: if 42% of these sites are unfavourable, what is the condition of the wider uplands? Data from the Countryside Survey suggest that, while there are no major changes in the area of different habitats, there are changes in the composition of certain habitats. Thus there is no easy answer: upland biodiversity does not appear to be faring disastrously, but neither is it flourishing.

In some ways, this ambiguity relates to the difficulty of attempting to generalise across entire systems. In reality, whilst some species do well, others decline. While some areas experience significant pressures or change, others do not. Referring to the state of upland biodiversity in general therefore potentially misses the complexity of natural systems and our interactions with them. There are also issues relating to the data and our ability to understand what is happening to upland biodiversity. Different data sets refer to different habitat categories and different periods of time, making comparison difficult, and sampling methodologies can potentially miss or under-estimate emergent trends.

At best, the current data do not suggest that there are very significant changes afoot. Yet, at the same time, we do know that there are big processes taking place—such as climate change and changes in land management—and, while we may not yet have observed the consequences, we have a good understanding of the likely outcomes and therefore the challenges.

### 8.3. Current challenges

The biodiversity of the uplands has always been subject to change. In recent decades, there have been large-scale changes such as the decline in sulphur-driven acidification with related ecological improvements in the uplands. Levels of nitrogen deposition have also begun to decrease, but there have been long-term impacts, especially on mosses<sup>10</sup>. Levels of ozone continue to increase and may lead to shifts in species composition, reductions in biomass and the loss of key species<sup>11</sup>. There can also be significant local impacts from high numbers of grazing animals, but here we focus on two key issues: climate change and changing land management practices.

<sup>8</sup> This information is taken from the British Trust for Ornithology Breeding Bird Survey data for Scotland and collated by SNH as part of their assessment of trends in the abundance of terrestrial breeding birds: [http://www.snh.org.uk/trends/trends\\_notes/pdf/B394077.pdf](http://www.snh.org.uk/trends/trends_notes/pdf/B394077.pdf).

<sup>9</sup> This information is extracted from the British Trust for Ornithology British Breeding Bird Survey for 2008. See <http://www.bto.org/bbs/results/bbsreport.htm>.

<sup>10</sup> Britton, A.J., Beale, C., Towers, W., Hewison, R.L., (2009), Biodiversity gains and losses: evidence for homogenisation of Scottish alpine vegetation, *Biological Conservation*, 142, 1728-1739.

<sup>11</sup> Coyle, M., Ashmore, M., Barnes, J., Heath, J., Hayes, F., Keelan, R., Mills, G., Peacock, S., Toet, S., (2006), "Upland vegetation and ground-level ozone". The Future of Upland Biodiversity Conference, 8 Dec 2006, Perth, <http://www.perth.ac.uk/specialistcentres/cms/Conferences/Documents/Upland%20vegetation.pdf>.

### 8.3.1. Climate change

It is now widely accepted that the planet is warming and that this warming is a result of human action (Section 5). Current projections suggest that, by the 2080s, Scotland will be warmer, especially in summer, with wetter winters, and that the numbers of extreme events will increase. Such changes are likely to have significant impacts on upland biodiversity, indeed there are indications that climate change is already affecting upland species (see box). As the climate changes, it is expected that species will move up hillsides and that species already confined to the high tops, such as ptarmigan *Lagopus mutus*, may be lost as conditions become unsuitable or as they are out-competed by new species colonising their environment. There is likely to be increased erosion and siltation, due to intense storm events, and increased drying out of soils, due to changes in precipitation patterns with associated soil loss through water and wind erosion. The impacts on many upland species are likely to be severe because they are often slow-growing and may be unable to adapt quickly enough, resulting in extinction in Scotland.

One thing is certain: the nature of the uplands will change. The question is what, if anything, we do about it. There is already a significant amount of work exploring the potential of creating corridors or much more connected landscapes that could potentially facilitate the movement of species as they adapt to their new environment<sup>12</sup>. But if a species is declining in Scotland because its habitat is shifting northwards and/or uphill, should we intervene to slow the process or should we accept the magnitude of the changes taking place and accept that it may become extinct here? Difficult decisions may have to be made in the years to come.

## In Focus: Golden Plover *Pluvialis apricaria* in a changing climate

The golden plover breeds in the British uplands, which are at the southern edge of its range. Since climate change is expected to result in its distribution shifting north and contracting, it is expected to be one of the species with a precarious future in the UK.

One of the main food sources for golden plover is the crane fly. Recent research by Pearce-Higgins et al. has found a negative relationship between warmer summers and golden plover productivity<sup>13</sup>. The research found a negative relationship between crane fly abundance and August temperatures, and, as this relationship would suggest, a negative relationship between golden plover population size and August temperatures two years previously.

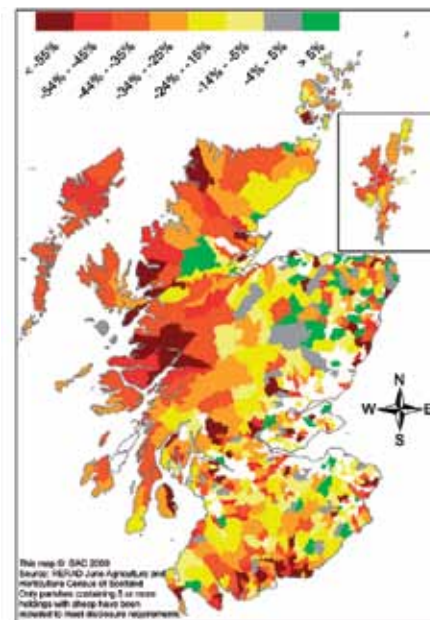
Having established the relationship between previous August temperature and crane fly abundance, and between crane fly abundance and golden plover chick mortality, the researchers used their results to predict the consequences of continued warming. Their model suggests that increasingly severe population declines are likely as temperatures rise. Their analysis therefore suggests that climate change poses a significant threat to the long-term viability of southern golden plover populations through reductions in the abundance of their crane fly prey.

### 8.3.2. Changing upland management

Many upland areas are currently subject to significant changes in management. The most prominent is the so-called 'retreat from the hills' which has seen the numbers of livestock, notably sheep, in upland areas decline markedly (figure 3)<sup>14</sup>. To a significant degree, this decline is the expected outcome of a change in policy whereby agricultural support payments have been decoupled from the level of production. The level of support a farmer receives is no longer related to his stock numbers but to a series of Statutory Management Requirements and Good Agricultural and Environmental Conditions. Since the incentive to have large numbers of animals has been removed, farmers are now making decisions about stock numbers on the basis of the market and, given that much hill farming is uneconomic, many farmers have been de-stocking to cut costs<sup>15</sup>.

Although the relationship between stocking levels, grazing and biodiversity is complex (often varying at a very local scale), these livestock declines suggest that grazing regimes are changing in many areas. This is likely to lead to change in species composition and vegetation structure which, in turn, will affect the insect, bird and mammal assemblages present. Some species and habitats will benefit from the removal of livestock but, for others that are dependent on grazing, the loss of livestock is likely to be detrimental to their condition and conservation value (although the compensating impact of wild herbivores must not be discounted).

Figure 3: Change in Sheep numbers between 1999 and 2007, by parish.



<sup>12</sup> For details of Forest Research's work on a Forest Habitat Network for Scotland see: <http://www.forestresearch.gov.uk/website/forestresearch.nsf/ByUnique/INFD-69PF6U>.

<sup>13</sup> Pearce-Higgins, J., Dennis, P., Whittingham, M.J., Yalden, D.W., (2009), "Impacts of climate on prey abundance account for fluctuations in a population of a northern wader at the southern edge of its range", forthcoming in *Global Change Biology*, available at <http://www3.interscience.wiley.com/journal/119881750/issue>

<sup>14</sup> SAC, (2008), *Farming's Retreat from the Hills*, <http://www.sac.ac.uk/mainrep/pdfs/retreatreport.pdf>.

<sup>15</sup> Royal Society of Edinburgh, (2008), *Committee of Inquiry into the Future of Scotland's Hills and Islands* [http://www.rse.org.uk/enquiries/hill\\_and\\_island\\_areas/](http://www.rse.org.uk/enquiries/hill_and_island_areas/).

If it is established that a decline in livestock numbers is having negative impacts (and further work is needed on this), decisions will be needed on whether or not to pay for the continuation of prior management to safeguard particular species in key locations. But land management will continue to evolve and it will not be possible to micro-manage the entire landscape for particular species.



## In Focus: Deer management and biodiversity

Scotland is home to several deer species—Red, Roe, Fallow and Sika—with Red and Roe being the most common. Red deer are the predominant species across the uplands where they are managed as a sporting resource on many Scottish estates. Managers maintain the population at levels that enable them to engage in a sporting cull but sometimes the density required to maintain the sporting interest creates a tension with biodiversity, for instance through high levels of grazing and the browsing of saplings, limiting tree regeneration. At the same time, red deer are a crucial part of upland ecosystems and a beneficial species; their grazing can help to maintain some communities, creating niches for seedling regeneration. Red deer in the uplands are therefore an economic asset and, in interactions with habitats and species, can create both costs and benefits.<sup>16</sup>

While in the past there has been conflict over deer management, with nature conservationists expressing strong concerns about high deer numbers and impacts on biodiversity, recent years have seen attempts to move the debate towards a more consensual approach. The goal is for public agencies, local deer managers and estates to work together to promote sustainable management of wild deer and to address situations where red deer have a negative influence on natural heritage objectives. This new strategy for wild deer moves debate away from polarised positions and re-casts deer as a valued asset that needs to be managed sustainably and can contribute to a high-quality environment, sustainable economic growth and social well-being.

### 8.4. Emerging pressures

In addition to the current and most immediate pressures on upland biodiversity, there are emerging issues that may have significant impacts. Two examples are given here: how we respond to climate change, and how we respond to the increasing concerns about global food security.

#### 8.4.1. Our response to climate change

In some locations, our response to climate change could drive greater change in the uplands than climate change itself, at least in the short-term. The Scottish Government has set ambitious targets to reduce greenhouse gas emissions and rural land use is acknowledged as one area that has an important role to play. Crucially, while there is a great deal that lowland agriculture can do, much of the attention could be focused on the uplands. There is, for example, a goal to increase woodland cover from the current 17% of Scottish land area to 25% by the second half of the century. This will require increasing planting rates from the current 4,000-5,000 ha/yr to 10,000-15,000 ha/yr<sup>17</sup> and, in the context of parallel concerns about food security, it is likely that increases in forests will be targeted at the least productive land.

Similarly, the development of renewable energy and greenhouse gas emission targets has driven the expansion of renewable energy projects in Scotland, especially in the uplands. Ministers want 50% of the demand for Scottish electricity to be supplied from renewable sources by 2020, with an interim milestone of 31% by 2011. Scottish Government suggests that these targets will be met comfortably, which could imply that the pressure on the uplands is not great. But in the UK context, Scotland has the greatest potential capacity for renewable energy production and could become a net exporter: the requirement on the UK to meet EU renewable energy targets by 2020 could lead to strong demand from elsewhere in the UK for Scottish renewable energy.

Wind farms, in particular, are a prominent addition to many upland landscapes and, while they are contributing to meeting government targets, concerns remain about their impacts on birds, wildness and carbon stores. In order to limit impacts on biodiversity, some conservation organisations have taken the pragmatic approach of seeking to provide locational guidance for future development, but others remain concerned that upland habitats are suffering from a lack of a planned and coherent approach to development<sup>18</sup>.

<sup>16</sup> Deer Commission for Scotland, (2008), *Scotland's Wild Deer: A National Approach*, <http://www.dcs.gov.uk/information/Publications/Wild%20Deer%20Strategy%20Final%20Proof.pdf>

<sup>17</sup> Scottish Government, (2009), *Climate Change Delivery Plan: Meeting Scotland's Statutory Climate Change Targets*. Edinburgh: Scottish Government, <http://www.scotland.gov.uk/Resource/Doc/276273/0082934.pdf>.

<sup>18</sup> Bright, J.A., Langston, R.H.W., Bullman, R., Evans, R.J., Gardner, S., Pearce-Higgins, J., Wilson, E., (2006), *Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland*. RSPB Research Report No 20. Available online at: [http://www.rspb.org.uk/Images/sensitivitymapreport\\_tcm9-157990.pdf](http://www.rspb.org.uk/Images/sensitivitymapreport_tcm9-157990.pdf); John Muir Trust, 2008. Impacts of wind farms on upland habitats, <http://www.jmt.org/assets/pdf/policy/wind%20turbines%20on%20upland%20areas.pdf>



## 8.4.2. Agricultural intensification in the context of global food insecurity

During 2008, food prices increased dramatically and, although prices have subsequently fallen, the sharp rise re-focused attention on food production. The trend in recent years has been to reform agricultural policy so that agriculture became more environmentally friendly and instead of focusing on maximising production, the developing European model of multi-functional agriculture moved us towards a 'post-productivist' era. The rise in prices, however, along with the projected increases in global population and expected changes in eating habits due to a growing middle class globally, has concentrated minds on the need to ensure levels of production that will satisfy global need. Policy pronouncements have therefore tended to move back towards a focus on production and the need to ensure that Scotland's food production capacity is retained<sup>19</sup>.

If we do witness rising demand for livestock products over the medium term, the current worries about de-stocking and the marginality of hill farming could disappear, as rises in prices could make hill farming more economically viable. One scenario for the future of the uplands is therefore that production and productivity could increase and, although it is too simplistic to correlate extensive agriculture with environmental goods and intensive agriculture with environmental bads, intensification of farming in upland landscapes could have significant consequences for biodiversity.

## 8.5. Key issues for the future

### 8.5.1. Does the future of the uplands lie in the provision of 'public goods'?

It is widely acknowledged that much of Scotland's upland biodiversity is the result of, and needs, continuing management. Yet the current socio-economic activities through which the uplands are managed—such as estate management for sporting interests, farming or forestry—can be financially precarious, meaning that continued sympathetic management is by no means guaranteed. A key policy question therefore revolves around how best to secure continuing sympathetic management.

At present, the conventional way of securing management for biodiversity is through government-sponsored agri-environment schemes. However, only a very small proportion of the total agricultural budget goes to agri-environment schemes, with the majority of public funds paid to farmers through the Single Farm Payment (SFP). Because the SFP is not linked to production, there can still be significant changes in farming practices with consequent impacts on habitats and landscape. The shape and direction of public policy in relation to land use is therefore crucially important in shaping the uplands and their biodiversity (although it must be recognised that some upland land managers, including many estate owners, are less influenced by financial incentives, making them harder to influence through public policy).

The current trajectory in agricultural policy is towards a greater market orientation, and a lower level of government intervention, but agriculture and land management in the hills and islands is arguably an example of a sector where ongoing support will be needed. The importance of public support has been acknowledged<sup>20</sup> and much of the current debate now revolves around clarifying objectives: what are investments of public money in agriculture and rural areas trying to achieve? In answer, the current debate appears to be settling on the formulation that public money should be used to ensure the delivery of 'public goods'. In this context, 'public goods' or 'ecosystem services'<sup>21</sup> such as high water quality, carbon storage, flood protection, biodiversity and attractive landscapes.

Thus one focus of current debate relates to the possible reframing of public support for land management away from the current system, which amounts to a form of income support for farmers, towards a system that recognises and values the wider non-market benefits that land managers deliver, and pays them to deliver public goods. Instead of paying money to farmers to keep them in business on the assumption that their continued presence is beneficial, a system of public support that pays money to land managers for delivering to society a set of explicitly defined public goods is potentially more focused and accountable. While the management of the hills would still be dependent on public support, such a reframing would shift our perspective: instead of seeing upland agriculture as barely viable (a judgement based on the traditional agricultural outputs sold to market from hill farming), upland land management would be delivering a range of non-market goods that are valued by society.

With regard to upland biodiversity, a system of support based on the provision of public goods has the potential to be highly beneficial, but a critical issue will relate to which payments are linked to public goods. At present, biodiversity support is largely limited to the agri-environment schemes, which account for a small proportion of the support budget. Thus the question of how best to secure and pay for the delivery of public goods and biodiversity gains in the future will be the focus of ongoing public debate. There will also be an increasing pressure to prioritise and agree objectives, which will result in biodiversity 'winners and losers'.

<sup>19</sup> See speeches by Richard Lochhead at the Oxford Farming Conference 2009 <http://www.scotland.gov.uk/News/This-Week/Speeches/Greener/farmingfuture> and the NFUS AGM 2009 <http://www.scotland.gov.uk/News/This-Week/Speeches/Greener/nfu-agm-09>.

<sup>20</sup> Royal Society of Edinburgh, (2008), *Committee of Inquiry into the Future of Scotland's Hills and Islands* [http://www.rse.org.uk/enquiries/hill\\_and\\_island\\_areas/](http://www.rse.org.uk/enquiries/hill_and_island_areas/).

<sup>21</sup> Bonn, A., Rebane, M., Reid, C., (2009), "Ecosystem services: a new rationale for conservation of upland environments". In: Bonn, A., Allott, T., Hubacek, K., Stewart, J. (Eds.) *Drivers of environmental change in uplands*. Routledge, London and New York, pp. 448-474.

## 8.5.2. Balancing conflicting goals

The uplands have been the focus of a great deal of conflict. There have been very public battles over ski developments in the Cairngorms and elsewhere, over forestry in the Flow Country and, more recently, over wind farms and electricity infrastructure<sup>22</sup>. It is obvious that different people have very different ideas about what the uplands are for and that there is an enduring tension between 'use' and 'delight'<sup>23</sup>. It is a tension that finds expression in a range of smaller, less high-profile, biodiversity-related issues. There is, for example, a continuing conflict between moorland managers and conservationists over raptors. Conservationists have been re-introducing species like the white-tailed eagle and red kite and have been encouraging the re-colonisation of species such as hen harrier, in order to help re-establish the species in their old ranges (having previously been persecuted to local extinction). Yet where moorland is managed for shooting, a raptor that takes grouse can have a significant financial impact on the shoot. The conservation goals of increasing raptor populations come into direct conflict with other land uses, and long-term research to explore possible ways of reconciling this conflict is still ongoing<sup>24</sup>. An important issue for the future therefore relates to the ways in which conflicting goals for the uplands can be reconciled. Should there be some sort of agreement about a vision or framework for the uplands or simply an accommodation, with no agreement on vision but an acceptance of different positions with different interest groups pursuing their own objectives in parallel?<sup>25</sup>

## 8.6. What future for upland biodiversity?

When we look at the state of upland biodiversity today and think about its future, there are many reasons to be hopeful. Although we must recognise that there are problems—such as the fact that 42% of upland designated sites are in an unfavourable condition—we do have a comprehensive legislative framework with the Habitats and Birds Directives and there are many positive initiatives underway. There are individual landowners undertaking biodiversity initiatives; NGOs are undertaking important work on the large amount of land that they own; there are regional partnerships that are co-ordinating activity (such as the Southern Uplands Partnership and the national parks); there are sectoral fora, such as the Moorland Forum; and there are national fora such as the Scottish Biodiversity Forum, with its Upland Ecosystem Group, that are bringing stakeholders together. Yet there are still significant challenges and barriers to securing the future of upland biodiversity, not least because we often lack the necessary data to support decision making and because we lack a coherent approach to the uplands. Our ability to protect and enhance our upland biodiversity will depend to a significant extent on how we address these barriers.

### 8.6.1. Better data to underpin decision making

There is only very patchy data on biodiversity in the uplands and the lack of data could hinder our ability to make appropriate decisions<sup>26</sup>. Information about the current state of biodiversity, recent and ongoing changes, and trends in species and habitats is vital if we are to effectively target appropriate policy and subsequently evaluate the impacts on biodiversity itself. At present, data are only available from disparate sources and have been collected for different purposes. Where data do exist, they are sometimes not readily accessible because of the form of data storage or because of the staff time needed to extract them. Thus while the lack of data is being addressed by the development of modelling approaches<sup>27</sup> or through the use of scenarios as a means of exploring possible upland futures, there is a need for more efficient data capture and management. New technologies have the potential to help in environmental monitoring<sup>28</sup>, but the issue of how to collect data about a wide range of species and habitats at a meaningful scale over such a large and diverse part of Scotland will remain a key challenge in the medium term.

### 8.6.2. Need for integrated land management

The uplands are coherent areas that transcend administrative and landowner boundaries and, as a consequence, the management of upland biodiversity can often be difficult. Cooperation and integrated action are often needed because action by one landowner to protect biodiversity can only have a limited impact unless neighbouring land managers are also involved. There are many sorts of cooperation taking place across the uplands, but further integrated land management will be vital if the delivery of public goods from the uplands is to be enhanced. The nature of land ownership and the pursuit of private benefit, however, act as barriers to cooperation: each estate or farmer pursues their own business goals to maximise individual gain and cooperation usually involves compromise and a degree of individual sacrifice. Furthermore, there are complex social relationships between different interest groups and divergent ideas about what constitutes sustainable upland management, which make cooperation difficult. Achieving more integrated land management will not be easy and will require commitment from all with an interest in the uplands.

Another important element of achieving more integrated upland management relates to policy. Very many policies relate to the uplands

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<sup>22</sup> Lambert, R.A., (2001), *Contested Mountains: Nature, Development and Environment in the Cairngorms Region of Scotland, 1880-1980*, White Horse Press, Cambridge; Warren, C., (2000), "Birds, Bogs and Forestry' Revisited: The Significance of the Flow Country Controversy", *Scottish Geographical Journal*, 116 (4), 315-337; Warren, C. and Birnie, R.V., (2009), "Re-powering Scotland: Wind Farms and the 'Energy or Environment?' Debate", *Scottish Geographical Journal*, 125 (2), 97-126.

<sup>23</sup> Smout, T.C., (2000), *Nature Contested: Environmental History in Scotland and Northern England since 1600*, Edinburgh University Press, Edinburgh.

<sup>24</sup> See <http://www.langholmproject.com/index.html>

<sup>25</sup> Natural England recently published *Vital Uplands*, their vision for the English uplands in 2060, see <http://naturalengland.etraderstores.com/NaturalEnglandShop/NE210>.

<sup>26</sup> A similar point was made by Price, M.F., Dixon, B.J., Warren, C.R., Macpherson, A.R., (2002), *Scotland's Mountains: Key Issues for their Future Management*, Scottish Natural Heritage, Perth, <http://www.perth.ac.uk/specialistcentres/cms/Conferences/Documents/Scotlands%20Mountains2002.pdf>.

<sup>27</sup> Chapman, D.S., Termansen, M., Jin, N., Quinn, C.H., Cornell, S.J., Fraser, E.G., Hubacek, K., Kunin, W.E., Reed, M.S., (2009), "Modelling the coupled dynamics of moorland management and vegetation in the UK uplands", *Journal of Applied Ecology*, 46, 278-288.

<sup>28</sup> See <http://www.digital-rural.org/>

and potentially have an impact on upland biodiversity, yet they often come into conflict or do not complement each other<sup>29</sup>. It is difficult for land managers to work in any coherent or integrated way if there is a lack of a coherent policy framework. A greater degree of policy coherence will be an essential element of securing the future of upland biodiversity. The forthcoming Land Use Strategy required by the Climate Change (Scotland) Act 2009 (to be published by 31 March 2011) may help in this regard.

Finally, even if the issues of data and integration are addressed, upland biodiversity will not necessarily be secured. Even a cursory examination of the issues shows that biodiversity in the uplands cannot be considered in isolation; its future is intimately connected with wider issues about the sustainability of upland land use and of remote rural communities – as well as to national and international imperatives linked to climate change and food security. Thus the future of upland biodiversity is likely to depend on the degree to which we can find solutions to some fundamental and enduring policy problems: how to develop sustainable rural economies and communities in the uplands and remote areas on the periphery.



<sup>29</sup> Milne, J., Macchi, M., Price, M., (2007), *Effective delivery of biodiversity policy and action in the uplands of Scotland*, Centre for Mountain Studies, Perth, <http://www.perth.ac.uk/specialistcentres/cms/CompletedProjects/Pages/UplandsofScotland.aspx>.

# Concluding Comments and Questions for Debate

## Concluding Comments

The evidence gathered independently across the eight themes has repeatedly shown that in order to make progress the following six key challenges need to be addressed:

- a. **Change is ongoing:** Significant changes are already taking place. For example we already have an ageing population and infrastructural and services challenges. Likewise there are already pressures on water quality and biodiversity. We need to build on what we already understand and identify the gaps in our knowledge. This will improve practice and policy.
- b. **Measuring change:** To measure change we need the appropriate tools. Some exist already, but in other fields, such as the differences and similarities between “urban” and “rural”, there is no recognised formula. We need to develop meaningful measures and indicators. Any data must be understandable to decision-makers, be they “on the ground” or at national level.
- c. **Impact of variation:** We recognise that understanding change in rural Scotland is made more difficult because of its diversity. There are the familiar categories of “remote” and “accessible”, lowland and upland, catchments and habitats, but within those is found even greater variation. These localised differences must be addressed, but it is important that in attending to these, sight is not lost of any wider, strategic objectives.
- d. **Deciding priorities:** Given such complexities, progress will only be made through accommodation between different, justifiable priorities. There is a need to identify and debate conflicts and having recognised the tensions, scope out realistic and feasible plans.
- e. **Community leadership:** There is a need for the acceptance of shared responsibility. Successful rural development depends on a combination of policy measures and action by individuals, co operating groups and communities. Initiatives such as LEADER and Community Planning have shown that, with the right support, local people can be brought together to achieve wider policy outcomes.
- f. **Planning for interdependencies:** It is important to accept that interdependency is a fact of rural development. While it is necessary at times to consider one issue in isolation it is imperative that at the forefront of any thinking is the part it plays in the bigger system. In bringing together these individual components for the first time into one report Rural Scotland in Focus provides a valuable foundation for developing this approach.

## Questions for Debate

The issues facing rural Scotland are complex. So the identification of appropriate solutions requires further detailed consideration by a wide range of stakeholders.

Each of the preceding sections has provided background evidence and initial commentary on the multiple factors involved. As such they can be seen as helping set a foundation for further informed debate.

The eight questions considered as most important, and hence which could be used to kick-start the debating process on any one of these issues, are:

1. What are the specific policies and practices that will address the different pressures and opportunities associated with demographic change in rural areas ?
2. As Scotland recovers from recession how can rural areas exploit the character of their relatively robust economies and grow in the future ?
3. Do we have a rational basis for setting future priorities for rural community infrastructure or must it remain a perpetual urban-style catch up ?
4. Can recession-induced public spending cuts be used to realign services and catalyse community engagement for improved rural sustainability and prosperity ?
5. How can we ensure that rural communities benefit from policy decisions made primarily to address climate change ?
6. In a changing climate, water is a key Scottish asset but how will policy and land management practice protect and enhance this precious resource ?
7. How can farmland biodiversity declines be reversed in the face of often conflicting economic and legislative demands ?
8. Upland biodiversity is a key component of the quality and value of our environment but how do we ensure it is incorporated in thriving rural communities ?