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formerly the Edinburgh Consortium for Rural Research

Issue 80
Summer 2014

www.scrr.ac.uk



Agriculture: at the heart of rural Scotland

Prof Stuart Monroe sets out some of the challenges facing research scientists

AGRICULTURE IS A KEY PLAYER in the Scottish economy and this is especially true in rural areas. With food security rapidly climbing the political agenda, alongside plans for mitigation of climate change, the application of good science to the practical aspects of agriculture has never been more important.

Scotland's Rural College (SRUC) is in place to do just that with research, education and consultancy going hand in hand. In addition, its researchers examine many of the elements of social science that are required for a deeper understanding of the diversity of the rural environment and the attitudes of the people who live and work there.

Complementary research is being undertaken in many of Scotland's universities and research institutes. It is the aim of the Scottish Consortium for Rural Research (SCRR) to facilitate

collaboration in all areas of research that pertains to the rural environment.

Significantly, the traditional agricultural community is diversifying its sources of income to cope with the uncertainties of the next few years. Increasingly, SCRR is spreading its interests to embrace such issues as nature tourism, the availability of broadband in rural areas and the importance of 'citizen science'. The latter is a very effective assistant to the task of monitoring change. The gathering of observations, whether about local biodiversity or the onset of key milestones in the annual cycle of country life, these are all things to which we can collectively contribute.

Sound evidence lies at the heart of effective decision-making. SCRR is playing its part in bringing researchers together in order that this might have the greatest impact.

'Wordle cloud'
constructed
from SRUC's
recent report,
Rural Scotland
in Focus 2014

This issue in key words

‘Smart accelerator’
is a programme aimed at solving
difficult problems that bureaucrats
struggle with – **page 2**

‘Ecosystem services’
is a way to look at the role played
by the natural environment in our
society and economy – **page 3**

‘Digital divide’ suggests that people without the skills and facilities to access online services may be left behind— **page 3**

'Nature tourism' brings many visitors to Scotland, but it could bring yet more – **page 5**

‘Agri-residues’ such as ‘biochar’ and ‘bioslurry’ can be used as cheap, sustainable soil improvers – **page 9**

‘Citizen science’ means asking members of the public to help carry out research – **page 11**

About SCRR

**THE SCOTTISH CONSORTIUM
FOR RURAL RESEARCH –**

known until May 2012 as the Edinburgh Consortium – exists to promote sharing of ideas and techniques among a group of organisations active in research into land, freshwater, coastal and marine resources, and their uses.

Our member organisations have bases throughout Scotland and are at work all over the world: details on the back page.

Members' reports

University of Edinburgh, Scotland's Rural College

Smart, sustainable islands around Scotland

Andy Kerr of the Edinburgh Centre for Carbon Innovation explains the centre's 'accelerator' programme

WHILE NATIONAL AND LOCAL government aspires to improve the wellbeing of Scottish citizens, the practicalities have proved difficult for complex, overlapping social issues such as energy provision, resource use and mobility. This often reflects the challenge of bringing together multiple public and private sector stakeholders with different language, agendas and time scales.

Multiple public agencies (the Scottish Government, Scottish Enterprise, Highlands and Islands Enterprise, Cities Alliance, Transport Scotland and ECCI) have come together in a 'Smart Accelerator' programme, led by ECCI, to catalyse such projects. The overall aim is to create more resource efficient, low carbon islands (and city regions), drawing on international good practice and integrating and drawing on the knowledge and expert know-how of Scottish companies and Universities. The shortlist of supported projects will



PHOTOGRAPH: NESSY-PIC UNDER CC BY-SA 3.0 VIA WIKIMEDIA

Smart, sustainable transport? A plane at Barra airport

be announced later in June. Scotland has significant opportunity to become a test-bed for innovative ideas that can improve the economic, social and environmental conditions of its citizens,

as well as creating strong export opportunities for its enterprise sector.

edinburghcentre.org/Smart-Accelerator.html

Rural poor 'falling through the cracks', says report

Sarah Hunter-Argyle of SRUC on a new publication that shows why we need a strategy for rural areas

NEARLY EIGHTY PERCENT of over-60s in rural Scotland are living in fuel poverty, compared with 45% in urban areas – evidence that the rural poor and disadvantaged are often 'falling through the cracks'. This is one of the headline issues in SRUC's latest report 'Rural Scotland in Focus' (RSiF), released at the beginning of June.

While existing data shows the differences in levels of fuel poverty across 'rural' and 'urban' Scotland, Rural Scotland in Focus 2014 provides a new analysis based on age groups and local authority areas. It shows that on average, 59% of people aged over 60 in rural local authority areas are experiencing fuel poverty, compared to 45% in urban areas.

The highest levels of fuel poverty were found to be in the Orkney Islands and Eilean Siar council areas, where 75% and 76% of over-60s respectively are likely to be affected.

The report calls for anti-poverty policies and measuring tools that cater effectively for the needs of rural areas. It suggests the rural poor fall into the

gaps between national policies that do not adequately take account of rural issues, and rural policies that fail to address poverty. In addition, national measures of poverty, such as the Scottish Index of Multiple Deprivation (SIMD), are inadequate for areas of low population and dispersed settlements.

Dr Sarah Skerratt, the editor of the report, said: 'The cost of household heating is just one area of poverty in which there is an imbalance between rural and urban Scotland. Poverty and disadvantage in rural areas often remain hidden because national policies and measuring tools do not cater sufficiently for needs of rural areas, while rural strategies do not consistently highlight poverty or how to address it.'

This is the third issue of RSiF, which is produced every two years by SRUC's Rural Policy Centre. The reports provide impartial evidence-based commentary that takes you to the heart of key rural issues. Other issues explored in this latest RSiF report include rural housing need, the experiences of young people and the competing demands on

Scotland's countryside. The report highlights their inter-connectedness. For example, there are links between the need for affordable housing, training and job opportunities, broadband and public transport, combined with pressures on a finite rural land supply to meet these needs (e.g. land for housing, business incubator units, renewables and tourism).

Dr Skerratt said: 'We suggest policies for rural Scotland do not show the same level of inter-connectedness as the issues faced by rural residents in their everyday lives. In order to address this we believe there must be an over-arching vision and strategy for rural Scotland, with the tools to assess progress. This would help to focus action on alleviating the challenges, while maximising opportunities presented by its inspiring people and its significant environmental assets.'

www.sruc.ac.uk/info/120428/rural_scotland_in_focus

Below: new report, Rural Scotland in Focus 2014



Members' reports

CEH, Forest Research, James Hutton Institute and University of Edinburgh; SRTF

'There can be no doubt Scotland's natural environment is one of our greatest assets'

THE AIM OF ECom Scotland (Ecosystem Services Community Scotland) is to become a community of practice for ecosystem services research, decision-making and natural resource management in Scotland.

Its four founding organisations (Centre for Ecology and Hydrology; Forest Research; James Hutton Institute; University of Edinburgh) launched the initiative with a conference and workshop, inviting a wide range of stakeholders to become part of the emerging community. Stakeholders included members of Scottish Government, local authorities, research organisations and universities, environmental NGOs and SMEs.

The need for effective research to support and protect ecosystem service delivery remains pressing, particularly as biodiversity continues to decline. Ecosystem services affect all sectors of society and the economy and provide a way to integrate multiple policy and practice domains. ECom aims to align Scottish ecosystem services research, to maximise value, identify synergies, and avoid duplication. Researchers will work with Policy and Practice to gain better understanding of user needs, provide relevant research, and achieve impact. Members will organise and promote events to support knowledge



PHOTOGRAPH: MIKE TALBOT

Joined-up thinking on ecosystems

Kate Morrison describes a new joint initiative by the name of ECom Scotland

exchange, and promote these events through their extensive networks.

Paul Wheelhouse, Minister for Environment and Climate Change, endorsed the initiative, stating: 'I very much welcome the establishment of ECom. There can be no doubt that Scotland's natural environment is one of our greatest assets. By gaining a deeper understanding of land use issues, we



can achieve better management of this vital natural resource, to the benefit of everyone and our environment.

Effective knowledge exchange and collaboration through initiatives like ECom will help us harness opportunities to work together to attain the best possible outcomes for future generations.'

<http://escomscotland.wordpress.com>

Church can play its part in tackling the 'digital divide'

Murdo Macdonald of SRTF discusses the urgent need to help by working in the wider community

THE SCOTTISH GOVERNMENT has identified the 'digital divide' the economic and social inequality due to access to, use of, or knowledge of the internet as being an area of concern. In addition, the Royal Society of Edinburgh has recently published a report on this issue.

There are a number of aspects to digital exclusion, including:

- the rural-urban divide
- the age divide
- the education divide
- accessibility for people in poorer communities (and the resulting poverty premium)
- accessibility risks for people with disabilities

There is an urgent need to continue to prioritise this aspect of inequality, especially as much access



to services and benefits in the future is planned to be 'digital by default'.

The Church of Scotland, with its network of people and buildings throughout the country, is working with our colleagues in the Scottish Government to explore whether there

'Church buildings are often the only public buildings in a rural setting'

are specific ways in which we can contribute to alleviating the problems. For example, church buildings are often the only public buildings in a rural setting; there may be opportunities for the community to be provided with computers and internet access. In addition, people may not have the requisite skills, experience or confidence in working with computers. There may be people in congregations who can offer practical assistance to those in the community who struggle, for example, with online forms.

Congregations are being urged to be aware of the issues that arise out of the digital divide, and to make every effort to tackle the effects.

Royal Society of Edinburgh report on digital participation: www.royalsoced.org.uk/1136_FinalReport.html

PHOTOGRAPH: ISTOCKPHOTO.COM

Members' reports

Society of Antiquaries of Scotland; Royal Botanic Garden Edinburgh

Exciting times ahead for Scotland's past

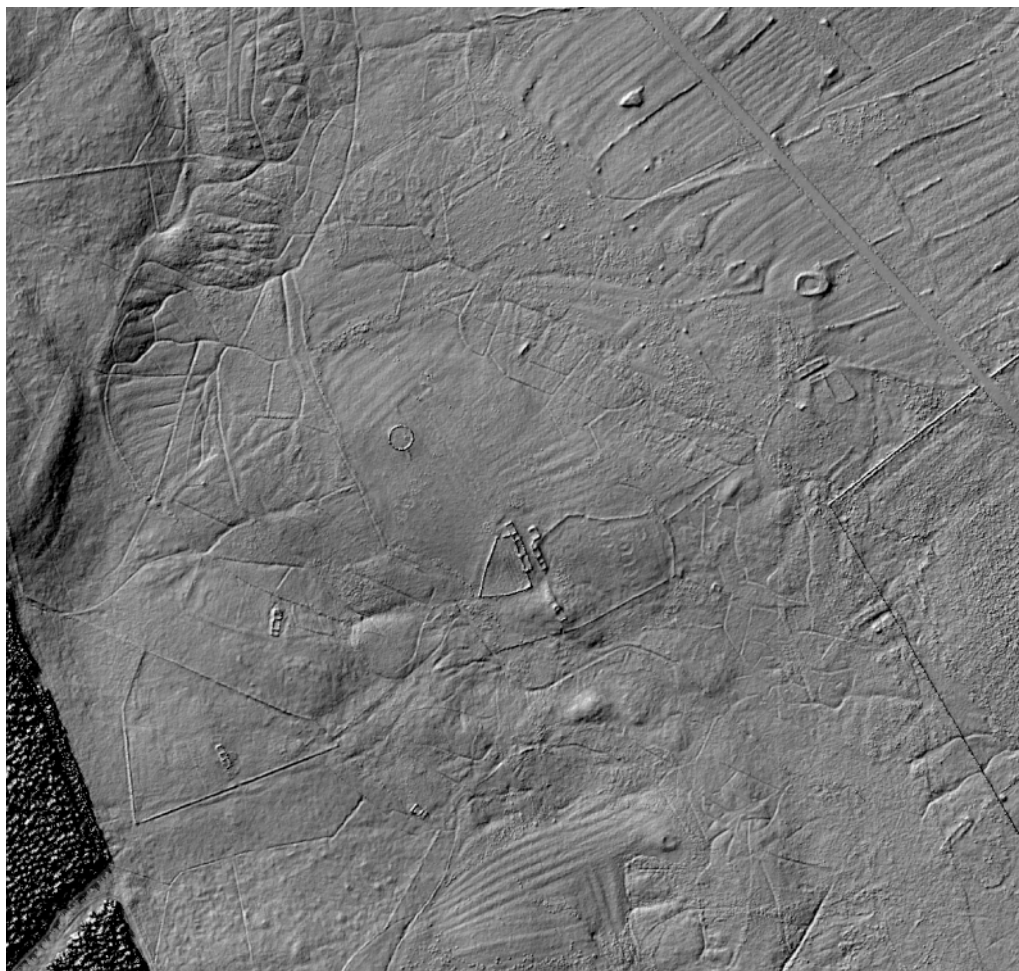
With a year-long celebration of archaeology coming up in 2015, Jeff Sanders of the Society of Antiquaries of Scotland

THESE ARE EXCITING TIMES for archaeology in Scotland. In a recent speech, Cabinet Secretary for Culture and External Affairs Fiona Hyslop compared archaeology to Heineken in its ability to reach parts that other disciplines cannot. Certainly, archaeology plays an important part in the estimated £2.3 billion that the historic environment contributes to Scotland's national gross value added.

But as well as economic and tourism benefits, archaeology also contributes to education, community well-being and a sense of place. Public interest in the hidden past remains high and next year will see a country-wide celebration of Scottish archaeology – Dig It! 2015. On a policy level, the new Historic Environment Strategy will be followed by a dedicated Archaeology Strategy.

Collaborative by nature, archaeology continues to tell Scotland's story and technology is opening up a new research frontier. For example, terrestrial laser scanning enables us to record and visualise surviving archaeology, such as at Parkneuk, a prehistoric 'four poster' stone circle. This work was arranged in partnership with the landowner, Forestry Commission Scotland, AOC Archaeology, and Historic Scotland.

Right: laser scanning from the air reveals abundant settlement traces in Caithness



PHOTOGRAPHS © AOC ARCHAEOLOGY LTD (CAITHNESS); © FCS (PARKNEUK)

Hedging our bets to preserve ancient yews

Paula Bushell of RBGE describes a conservation project that will act as a living equivalent of a seed bank

YOUNG PLANTS propagated from ancient and threatened yew trees and collected from around the world are being used to create a unique heritage hedge and important conservation resource in Scotland at the Royal Botanic Garden Edinburgh (RBGE).

The hedge is being created using 2,000 small trees of the common yew (*Taxus baccata*). Planted around the perimeter of the garden, it will cover a kilometre in length and take an estimated 10 years to complete.

At the heart of the project are progenies of the most ancient of all, the Fortingall yew in Aberfeldy,

Perthshire, estimated to be 3,000 years old and the oldest living tree in the UK, if not in Europe.

RBGE has plants propagated from famous trees in England, including Down House in Kent and Borrowdale in Cumbria; from Wales, represented by churchyard trees at Buttington in Powys, St Digain's in Llangernyw and St James's in Nantglyn; from the celebrated yews at Crom Castle in County Fermanagh, Northern Ireland; and in the Republic



Will Hinchliffe, horticulturist, starts the hedge

of Ireland, from heritage yews at Muckross Abbey in Killarney. In total, 14 countries will be represented in the hedge.

RBGE's Martin Gardner says: 'This is the first time a botanic garden will be surrounded by a conservation hedge and it is of great importance.'

There is a need to conserve old-growth trees and remnant populations, and to safeguard plant biodiversity in the face of global environmental change.'

PHOTOGRAPH © RBGE

is looking forward rather than back



'Four poster' stone circle at Parkneuk, Perth, recorded in detail by laser scanning

How to learn more

There are lots of resources and expertise to call on if you are interested in archaeology, particularly in a rural context. There are projects like the Historic Landuse Assessment and Scotland's Rural Past, or resources such as Local Authority Historic Environment Records and Canmore.

Links and further information have all been collated in the 'Rural Research' page of the Scottish Archaeological Research Framework (ScARF): www.scottishheritagehub.com

We need to safeguard and promote the gems of the 'dinosaur isle'

Scotland must protect its fossil heritage, says Nick Fraser of NMS

SKYE AND RAASAY have a rich geological heritage spanning the last three billion years of Earth's history. In particular, Skye is known as the 'dinosaur isle' due to its rich heritage of fossil sites, particularly from the Jurassic period, around 200 million to 145 million years ago.

Scotland's Fossil Code, the first truly national code of its kind, has offered best practice and guidance in the collecting and care of fossils since it was published in 2008; but there are unfortunately still examples of people damaging these sites by collecting fossils in an irresponsible way.

A public meeting was recently convened in Portree by Scottish Natural Heritage (SNH), The Highland Council, National Museums Scotland (NMS) and the Hunterian Museum (University of Glasgow) with the aim of better safeguarding and promoting the remarkable fossil heritage of the island.

As Dr Neil Clark of the Hunterian Museum says, 'Skye has internationally important fossils. It is the only place in Scotland from which dinosaurs have been found and has more than 10% of the world's Middle Jurassic dinosaur species and more than 15% of the Middle Jurassic dinosaur sites. It is important that we look after and properly document these rare and



Dinosaur tracks at An Corran, Skye

globally significant fossil remains for future generations to study and enjoy.'

It is hoped that ultimately a system will be developed to record, rescue and safeguard important fossils found on the island's beaches. There was also a call for the promotion of the islands' fossil heritage as part of a tourism initiative to help boost the local economy.

Ways to achieve nature tourism growth in Scotland

A recent seminar has identified ways to boost this invaluable sector, reports Kathy Velander of Napier University

THE AIM OF THIS SEMINAR (December 2013) was to identify practical ways to achieve growth in nature-based tourism in Scotland. Twenty-seven actions were identified by participants, resulting in eight strategic objectives. Some of these are already being tackled: e.g. improve broadband communication throughout Scotland; gather information on the availability and use of public transport by tourists. Others will require longer-term effort, with collaboration between businesses, government agencies and educational institutions (e.g. develop more sustainable use of the natural

environment; develop human capital to deliver nature-based tourism).

Conference participants noted that it is difficult to make comparisons between the various sectors in the tourism industry, so we need standardised methodologies that can be used throughout. This is particularly important for nature-based tourism; the social, economic and environmental impacts on local people and rural areas can be large. Finally it was suggested that a meeting be set up with key partners involved in tourism to further explore the strategic objectives, and the means to make them happen.



Rhum from Eigg

For more details, including how the strategic objectives were developed, see www.scrr.ac.uk/events.php

PHOTOGRAPH © HUNTERIAN MUSEUM

PHOTOGRAPH: JAY MACKINNON

Members' reports

SRUC, UHI and University of Stirling; Forest Research



WHATEVER WE MIGHT THINK of the 'seismic' outcomes of the recent elections to the European parliament, European funds for research are likely to remain attractive to SCRR members for at least the duration of the current funding round, perhaps especially Horizon2020.

Whilst the European Directorates are always open to communications about research priorities, the voices of individuals, single organisations, or even single member states carry only limited weight. Such voices will tend to seem like special pleading: they may be received politely, but EU directorates are much more interested in views that can be shown to span member states and have broad-based European support. In addition, the big emphasis on 'innovation' in much of the funded programme will tend to mean a more favourable reception for views that carry both academic and industry support.

Networks that link research providers in different member states can, therefore, be influential in informing the selection of topics for research calls in Horizon 2020 – and more so when the network includes industry representation. Some members of SCRR are involved in networks that appear to be effective.

Animal Task Force (ATF) aims to promote a sustainable and competitive

Influencing the direction of Europe

Future research is likely to be guided by pan-European networks that unite academia and industry. John Oldham (SRUC), Martin Price (Perth College, UHI) and Brian Austin (University of Stirling) explain why this is so.

The multiple benefits of trees

Steve Penny of Forest Research reports on recent work that shows how trees influence their environment

FOREST RESEARCH SCIENTISTS contributed to the SRUC-SEPA Biennial Conference in April - 'Delivering multiple benefits from our land: sustainable development in practice'. Presentations were given by Samantha Broadmeadow on 'The national map of woodland creation: opportunities to improve water quality and reduce flood risk in Scotland' and by Dr Anna Lawrence on 'Integrated farm forestry needs integrated advisory systems: a stakeholder-based appraisal of options in Scotland' (www.sruc.ac.uk/srucsepaconf).

In addition to the opportunities to use woodland creation to improve water quality and reduce flood risk, there is a need to be mindful of the potential effects of acidification.

The evidence has recently been summarised in a research note, 'Forestry and surface water acidification', by Tom Nisbet of Forest Research and Chris Evans of the Centre for Ecology and Hydrology. It explains how forest management practices can affect surface water acidification. The primary mechanism is the ability of tree canopies to capture more sulphur and nitrogen pollutants from the atmosphere than other types of vegetation. Tree planting can influence acidification, as can cultivation, drainage and road building, fertiliser use, felling and harvesting, and restocking. This research note assesses the role of tree species, planting scale and design (www.forestry.gov.uk/forestry/HCOU-4VXJ5B)



A Forest Research exhibition panel on the contribution of urban trees

Trees also play an important role in the green infrastructure of urban areas. While Forest Research is primarily known for researching issues associated with forests and woodlands, we're increasingly finding the need to better understand how trees can improve life in built-up areas. (www.forestry.gov.uk/fr/urbantrees)

Members' reports

Institute for Aquaculture, University of Stirling

livestock sector in Europe. Its members include a single representative member of the research provider community from thirteen member states, and four technology platforms; it expects shortly to have further industry representative bodies amongst its membership. Within ATF, the Easter Bush Research Consortium (EBRC – comprising SRUC, Roslin Institute, Royal (Dick) Veterinary School and the Moredun Research Institute) represents farm livestock research providers in the UK.

In 2013 ATF produced a white paper on 'Suggested priorities for support under Horizon 2020 to enhance innovation and sustainability in the livestock production sector of Europe's food supply chains'. This was developed amongst the membership, discussed with senior players in three of the European Commission's Directorates General (RTD, AGRI and SANCO), then refined and presented to DG RTD at the time they were developing the first Work Programme calling for submissions for funding under Horizon 2020. Several topics in the white paper appeared in the first call in December 2013 and the ATF has recently been asked by DG RTD to make further detailed suggestions to inform the next call.

Euromontana is the European association for co-operation and development of mountain territories.

It has about 75 member organisations from 20 countries, including local and regional authorities, business organisations, research institutes, training centres, and environmental, forestry and development agencies. It has particularly strong connections to DG AGRI, and has influenced policy, notably for quality products from mountain areas – the outcome of many years of work, including an FP6 project in which both UHI and SRUC were involved.

Euromontana has had quite a high success rate with both FP and Interreg projects that it has either coordinated or catalysed; involvement in such projects is a strong motive for membership.

AQUAEXCEL offers access to top-class research infrastructures for both basic and applied research, giving aquaculture research groups the opportunity to utilise AQUAEXCEL's installations. The AQUAEXCEL project regularly invites proposals from European research groups for scientific research that utilises the installations of any of the participating Aquaculture Research Infrastructures. These installations are made available to the research community for Transnational Access (TNA) with the support of the European Union 7th Framework Programme for Research and Technological Development (Infrastructures). Interested researchers

may propose aquaculture research projects that:

- Involve research on any of the available fish species at the selected aquaculture research infrastructure
- Are compliant with the EATiP Strategic Research & Innovation Agenda
- Involve visits of one or two people to a research infrastructure that provides installations not available in their own country, for periods up to three months.

Further information and contacts

Animal Task Force (ATF) animaltaskforce.eu/
SCRR contact: john.oldham@sruc.ac.uk

Euromontana www.euromontana.org/en/
SCRR contact: martin.price@perth.uhi.ac.uk

AQUAEXCEL www.aquaexcel.eu/
SCRR contact: brian.austin@stir.ac.uk

Horizon2020: ec.europa.eu/programmes/horizon2020/

There may be other effective networks of this kind in which SCRR members are involved. Colleagues across SCRR who wish to alert our members to activities of this kind should inform Stuart Monro or Alastair Macdonald who will post relevant information on our website.

Stuart Monro: stuart.monro@dynamicearth.co.uk

Alastair Macdonald: Alastair.Macdonald@ed.ac.uk

Hybrid mussel populations in Scotland

Joanna Wilson of the Institute of Aquaculture, University of Stirling, on a situation where breeding really matters

PLANS ARE AFOOT to encourage the development of sustainable and productive shellfish farms throughout Scotland, where the shellfish sector of the aquaculture industry has grown strongly over the last ten years. There is only one problem with these plans: farmers and researchers are not sure what mussel species live in Scottish waters.

Parts of the Scottish shellfish sector have suffered in recent years due to increased numbers of a mussel with a particularly fragile shell and a reduced meat yield. A recent study of mussel populations in Scotland revealed the presence of *Mytilus trossulus* – a mussel species that, in some conditions, outcompetes *Mytilus edulis*, the farmed blue mussel. Evidence also suggested that the



presence of hybrids negatively affect the production and profitability if such characteristics make them less marketable, and could cause problems

Blue mussels,
Mytilus edulis

for mussel growers if their presence is left unchecked. Mussel growers need to know what species live in Scottish waters to effectively manage their stocks and to mitigate risks associated with an expansion in hybrid range.

Existing genetic tests are not sensitive enough to detect all mussel species in Scotland. To enable a better assessment of population genetics, new markers are currently being developed from large scale sequencing of the mussel genome.

This collaborative research between the Institute of Aquaculture at the University of Stirling and Marine Scotland's marine laboratory in Aberdeen will look at locations throughout Scotland to give a more complete picture of mussel species existing in the country.

Members' reports

Field Studies Council; RSPB

Millport marine biology station gets new lease of life

Daniel Moncrieff of the Field Studies Council describes the facilities on offer at the revamped research centre

THE MARINE STATION AT MILLPORT transferred ownership from the University of London to the Field Studies Council (FSC) early in 2014 and FSC have just completed the first phase of a five-year reinvestment and rebuilding programme.

FSC Millport is one of a network of 15 residential and 4 day centres that aim to promote fieldwork and provide outdoor learning opportunities for students. FSC Millport aims to fully utilise the research facilities at the site by making them accessible to the wider research and scientific community. These include the research vessel, R.V. Actinia, scanning electron microscope, microbiology facilities, temperature control rooms, large seawater tanks, and saltwater system that is connected to all our laboratories.

With the generous support of the Scottish Government, North Ayrshire Council and Highland & Islands Enterprise, we have begun re-establishing the centre's considerable reputation for marine and coastal ecology teaching. At the start of this year we created a large new workroom



PHOTOGRAPHER RACHEL SUMMERS

The research centre at Millport on the Isle of Cumbrae, now operated by the Field Studies Council

and extra recreational spaces for visiting students to use whilst on residential courses at the Centre. We have also upgraded our wireless and IT facilities. Funding has been secured for a new 150 seat lecture theatre, extra classroom and a new accommodation

wing of 30 comfortable twin en-suite rooms. We hope to both increase the number of professional development courses we run and attract even more university students and researchers to our facility.

RSPB Centre for Conservation Science

New 'virtual' centre will raise the profile of the RSPB's research and increase collaboration, says Jeremy Wilson

IT IS 50 YEARS since RSPB employed its first field research staff; the start of an enduring commitment to investment in science to help tackle the biggest conservation problems facing birds and the environment. In 2013 an independent review rated RSPB science as outstanding and advised us to strengthen external communication of our scientific work and its role in underpinning conservation action.

In response to that challenge, we recently announced at the Royal Society in London the establishment of our Centre for Conservation Science. The Centre is a virtual rather than a physical location. The markedly enhanced science section of the RSPB's website is designed to raise the RSPB's scientific profile, attract talented new staff, increased external collaboration, and funding. Ultimately,



its purpose is to help RSPB undertake more effective, evidence-based conservation action.

It offers 'one-stop-shop' access to information about our current scientific programme and team, employment and student project opportunities, details of over 1000 scientific publications, the latest blogs from our



Above left: the wood warbler, subject of a major project looking into its decline

field teams and news from the @RSPBScience Twitter feed.

In launching the RSPB Centre for Conservation Science, we have also showcased some of our most important recent scientific work of the past decade in a report that can be downloaded at the above web link or obtained as a hard copy by e-mailing me at jeremy.wilson@rspb.org.uk.

I would be delighted to have feedback regarding readers' experience of the new website, and your ideas for its development. I look forward to being able to introduce the Centre for Conservation Science and some of our current scientific work at an SCRR Directors' Lunch on October 27.

The new, enhanced research section of the RSPB website can be found at: www.rspb.org.uk/ourwork/science/

WOOD WARBLER: STEVE GARVIE UNDER CC BY-SA 2.0 VIA WIKIMEDIA

Climate-friendly farming in Cambodia

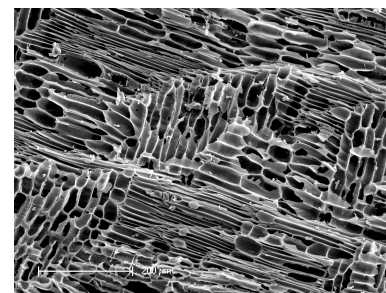
Simon Shackley of the University of Edinburgh is studying the use of biochar and other 'green' soil improvers

SIMON SHACKLEY IS working with farmers in Cambodia as part of a project funded by the Nordic Development Fund and managed by the Asian Development Bank (ADB). Just under one third of Cambodia's economy relies upon agriculture and 37 million dry tons of plant and animal wastes are produced in Cambodia yearly. Agri-residues are used as animal feed and bedding, manure and compost for soil improvement, as inputs to biogas digesters, fuel for brick kilns and stoves, etc.

Cambodia has around 200 rice husk gasifiers, the largest concentration in SE Asia, many installed at rice mills, providing power and/or electricity to operate the mill. Thousands of tons of rice husk biochar are produced yearly from such gasifiers; this has great potential to improve poor quality sandy acidic soils that are widespread in agricultural areas of the country. Rice husk biochar also stores carbon in the soil for hundreds, if not thousands, of years. At present, however, most of the rice husk biochar is not being used effectively as a soil amendment.



A biochar pilot investment project is now under way to demonstrate the production and use of biochar as a direct soil application and/or through mixing with other organic ingredients in three provinces. The pilot project will (a) focus on production of biochar, bioslurry, other organic amendments



Above: scanning electron micrograph of wood biochar produced from a gasifier in Cambodia (width of image c. 1 mm)

Left: field demonstrations using biochar in Takeo Province

and NPK as new fertiliser products (recipes for mixing and pelletising the mixed biochar, bioslurry, compost, manures, NPK, etc.) and (b) undertake agronomic field trial testing of the new products, while also developing a farmer field school and helping with capacity-building.

University of Edinburgh establishes India Institute

Inaugural conference includes medicine, veterinary medicine, engineering and social science

EDINBURGH'S COLLABORATION WITH INDIA stretches back to the 19th century and, in May this year, it moved up a gear with the staging of the inaugural conference of the Edinburgh India Institute. Edinburgh academics and their Indian collaborators in humanities and social sciences, medicine and veterinary medicine, and science and engineering took part.

Earlier, in March, animal health and welfare experts from the Roslin Institute and Royal (Dick) School of Veterinary Studies visited Bangalore to attend an international animal conference 'Advances in Veterinary Research: Impact and Opportunities' organised jointly by Edinburgh; the Commonwealth Veterinary Association; Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar; and the National Institute of Animal

Nutrition and Physiology, Bangalore. A film of their visit shows how Edinburgh is working closely with colleagues in India and asks how animal husbandry and welfare standards can be improved by sharing knowledge.

Conference topics included techniques to address infectious diseases in herd animals; new ways to tackle India's growing problem of rabid dogs; and treatments for other zoonotic diseases (those affecting both humans and animals). Delegates also learned about Edinburgh's use of technology to provide distance-learning opportunities around the world. In addition to a large number of postgraduate courses, Edinburgh has pioneered the provision of Massive Open Online Courses (MOOCs). These free online courses are available to anyone. The University of Edinburgh's



Bangalore conference delegates at the poster session

India office, based in Mumbai, provides a local liaison point for Edinburgh's activities across the country.

Film of the Bangalore visit in March:
www.ed.ac.uk/news/2014/film-170414

Members' reports

James Hutton Institute; SNIFFER

Whisky 'from land to bottle' at Royal Highland Show

The James Hutton Institute is showcasing its work via the national drink, reports Bernardo Rodriguez-Salcedo

THE FUTURE OF Scotland's national drink is being boosted by scientists at the James Hutton Institute. Their work across many fronts aims to ensure the sustainability and continued success of Scotch whisky, one of the world's best-loved tipples and a pillar of the Scottish economy. The impact of this research work will be highlighted at the 2014 Royal Highland Show, where the James Hutton Institute will showcase its work at their marquee on Avenue Q, in collaboration with the Scotch Whisky Research Institute (SWRI).

Research relevant to whisky making will be on display and our experts will be on hand to discuss our work, including sustainable management of peatlands, pressures on water supplies, provenancing



techniques to help tackle counterfeiting, quality and yield of the barley crop for malting purposes, resilience of agricultural systems,

Whisky, and the barley from which it is made

resistance to crop pests and diseases, preservation of rural economies and research on renewable energy.

Also at this year's Royal Highland Show the James Hutton Institute and the Scottish Association of Young Farmers Clubs (SAYFC) will be announcing the winner of the Institute's Best Soil in Show. It is the second time the Institute has run the award and this year they enlisted the future stewards of the soil, young farmers, to help roll out the competition right across Scotland. Samples from farms across the length and breadth of the country have been judged on their physical and chemical properties to identify the winner, who will be presented with a quaich (drinking cup) at the Institute's marquee on Thursday 19 June.

PHOTOGRAPH © JAMES HUTTON INSTITUTE

CLIMATE CHANGE ADAPTATION and mitigation are often considered separately, both in terms of policy and research. Commitments to reduce greenhouse gas emissions and move to a low carbon economy are of course a key ambition. But there is also strong recognition that Scotland's climate is already changing and of the need to increase our resilience to these changes in a way that supports the emergence of a low carbon economy.

So it makes perfect sense to integrate our climate resilience work with Scotland's premier low carbon hub – the Edinburgh Centre for Carbon Innovation (ECCI). We moved into ECCI in the middle of April. The buzz of the place, the inspirational people and companies, and the many great events hosted here soon led to discussions about new collaborations and business ideas. Key to developing a climate-resilient low-carbon Scotland is to work together to develop solutions that deliver across the economy, environment and society.

Our active project portfolio includes the delivery of the 2014 Adaptation Scotland program; liaising with community-facing organizations to help support communities become climate ready, as well as delivering a mentoring program on adaptation with public sector bodies. We are exploring new partnerships to build climate resilience into broader agendas for example health and wellbeing, and

Win-wins between climate change mitigation and adaptation

Ruth Wolstenholme and Anne Marte Bergseng on SNIFFER's plans to exploit synergies with the Edinburgh Centre for Carbon Innovation

Craig Hill, Merrick, within the Galloway and Southern Ayrshire UNESCO Biosphere Reserve



through a place-based approach such as our work with the Southern Uplands Partnership centering on the Galloway and Southern Ayrshire UNESCO Biosphere Reserve.

By bringing these projects and our knowledge of adaptation and resilience to the low carbon environment at ECCI we believe we can complement the work of those already at the centre, and equally that by making connections and links we can

strengthen each other's networks, knowledge and ability to deliver lasting climate action.

IPCC working group II - Climate Change 2014: Impacts, Adaptation, and Vulnerability
www.ipcc.ch/report/ar5/wg2/

IPCC working group III - Climate Change 2014: Mitigation of Climate Change
www.ipcc.ch/report/ar5/wg3/

PHOTOGRAPH: GALLOWAY AND SOUTHERN AYRSHIRE BIOSPHERE

Members' reports

Scottish Natural Heritage; Centre for Ecology and Hydrology

SCRR WAS RECENTLY INVOLVED as a partner in the development and delivery of a Scottish Natural Heritage 'Sharing Good Practice' event on 'Citizen Science – volunteer engagement in environmental monitoring'. The event took place on May 8 at the SNH Battleby Conference Centre near Perth and was for those involved in designing, managing and running citizen science monitoring and surveys, and for the users of the volunteer-collected monitoring data.

The main objectives were to develop better understanding of the connections between data collection and citizen science, to offer examples of good practice and opportunities to share concerns and expertise. There were over 70 participants representing the organisations who enable data to be collected and those who need the data for monitoring purposes. All presentations are on the web.

The Sharing Good Practice (SGP) event programme is a unique annual series of around 14 events for people from a wide variety of backgrounds. Managed by SNH and run in partnership with a variety of external stakeholders, SGP events provide opportunities for practitioners with differing levels of experience to network, learn from experts, influence future policy, share ideas and gain new knowledge, insight and inspiration.

Citizen science
at Glen Tilt



PHOTOGRAPH © SNH

Sharing expertise with 'citizen scientists'

A recent SNH conference looking at how to get the public involved in research is just one small part of its ongoing programme on Sharing Good Practice

Topics in the 2014-15 programme include events on subjects as diverse as landscape-scale community engagement, health and wellbeing, onshore wind energy developments, golf course biodiversity and invasive non-native species. All members of

SCRR will be very welcome at any of the events. For further information contact: alan.cameron@snh.gov.uk.

Sharing Good Practice event:
www.snh.gov.uk/policy-and-guidance/sharing-good-practice/

Common ragweed: invasion of an allergenic plant

Daniel Chapman of the Centre for Ecology and Hydrology, Edinburgh, on efforts to model a species' spread

THE SPREAD OF SPECIES beyond their natural ranges presents a major threat to biodiversity, agriculture and society. One of the most damaging non-native species invading Europe is common ragweed, *Ambrosia artemisiifolia*. Native to North America, ragweed has spread in southern and eastern Europe, bringing two main problems. As a crop weed it can cause more than 50% yield loss, while its airborne pollen results in a huge public health burden of allergy and asthma.

Through interdisciplinary projects funded by the EU, scientists from CEH are collaborating with researchers across Europe to understand the invasion. The CEH team are developing computer models for plant invasions that explicitly account for the processes underlying the invasion. They include seed dispersal through international trade pathways, long-

range atmospheric transport of the allergenic pollen and the effects of climate on ragweed's phenology and population growth. The ultimate goal is to predict how climate change might promote further invasion.

So what might be the future for ragweed? Early results suggest that northwards spread into southern Britain and up to the Baltic coast may occur this century. However, there are many uncertainties in this prediction. Not least is the recent arrival of an invasive beetle herbivore, *Ophraella communa*, which is actively devastating ragweed populations in Italy. Through collaboration with an EU COST Action, the CEH team are also trying to model the possible beneficial effect of this invasive insect in limiting ragweed invasion.

More details at <http://ragweed.eu/>



Common ragweed, *Ambrosia artemisiifolia*

PHOTOGRAPH: DENDROFIL UNDER CC BY-SA 3.0 VIA WIKIMEDIA

SCRR member organisations

The University of Edinburgh	www.ed.ac.uk
Moray House School of Education	www.ed.ac.uk/schools-departments/education
Royal (Dick) School of Veterinary Studies	www.ed.ac.uk/schools-departments/vet
School of Biological Sciences	www.ed.ac.uk/schools-departments/biology
School of Engineering	www.see.ed.ac.uk
School of GeoSciences	www.ed.ac.uk/schools-departments/geosciences
School of History, Classics and Archaeology	www.shca.ed.ac.uk/Research/
School of Social and Political Studies	www.sps.ed.ac.uk
Biomathematics and Statistics Scotland	www.bioss.ac.uk
British Geological Survey, Edinburgh	www.bgs.ac.uk
Centre for Ecology & Hydrology, Edinburgh	www.ceh.ac.uk
Crichton Carbon Centre	www.carboncentre.org
Forest Research, Northern Research Station	www.forestry.gov.uk/forestresearch
Heriot Watt University, School of Life Sciences	www.sls.hw.ac.uk
University of Stirling, Institute of Aquaculture	www.aquaculture.stir.ac.uk
James Hutton Institute	www.hutton.ac.uk
Moredun Research Institute	www.moredun.ac.uk
Napier University, School of Life, Sport & Social Sciences	www.napier.ac.uk/fhlss/SLSSS
National Museums of Scotland	www.nms.ac.uk
Roslin Institute, University of Edinburgh	www.roslin.ed.ac.uk
Royal Botanic Garden Edinburgh	www.rbge.org.uk
Royal Society for the Protection of Birds - Scotland	www.rspb.org.uk/scotland
Royal Zoological Society of Scotland	www.rzss.org.uk
Science & Advice for Scottish Agriculture	www.sasa.gov.uk
Scotland's Rural College (formerly Scottish Agricultural College)	www.sruc.ac.uk
Scottish Association for Marine Science, Oban	www.sams.ac.uk
Scottish Natural Heritage	www.snh.gov.uk
SNIFFER	www.sniffer.org.uk
Society, Religion and Technology Project	www.srtp.org.uk
University of Glasgow	www.gla.ac.uk
College of Medical, Veterinary and Life Sciences	www.gla.ac.uk/colleges/mvls/
College of Social Sciences	www.gla.ac.uk/colleges/socialsciences/
University of the Highlands and Islands (UHI)	www.uhi.ac.uk
Agronomy Institute, Orkney College	www.agronomy.uhi.ac.uk
Centre for Mountain Studies, Perth College	www.perth.uhi.ac.uk/specialistcentres/cms
Centre for Remote and Rural Studies, Inverness College	www.crrs.uhi.ac.uk
Environmental Research Institute, North Highland College	www.eri.ac.uk
Lewis Castle College, Stornoway	www.lewis.uhi.ac.uk/research
NAFC Marine Centre, Shetland	www.nafc.ac.uk
West Highland College, Fort William	www.whc.uhi.ac.uk

Members' meetings

www.scrr.ac.uk/events.php

MONDAY JUNE 30, 2014
Edinburgh Centre for Carbon Innovation (ECCI), The University of Edinburgh
11:00 SCRR Board Meeting
12:30 Directors' research lunch
Host: Dr Andy Kerr

MONDAY OCTOBER 27, 2014
RSPB Scotland, 2 Lochside View, Edinburgh Park, Edinburgh EH12 9DH
11:00 Executive Committee meeting
12:30 Directors' research lunch
Host: Prof Jeremy Wilson

Events

www.scrr.ac.uk/events.php

No events are scheduled at time of going to press. Please check the website.

People at SCRR

www.scrr.ac.uk/about.php

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COPY DEADLINE

The deadline for copy in the next issue is September 14th, 2014.

DISTRIBUTION

For all queries about the distribution of this newsletter, please contact the Secretary/Treasurer by email as above.

FUTURE ISSUES

Contributions to the SCRR newsletter (formerly the ECRR newsletter, and before that The Bush Telegraph) are welcomed. All contributions, comments and suggestions should be emailed to the Secretary/Treasurer as above.

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Design by [mobo media](#)

Printed in Scotland on recycled paper (100% post-consumer waste) by
The Jane Street Printing Company,
Leith, Edinburgh

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