scrr
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Rural research in Scotland

Prof Stuart Monro, scientific director of the SCRR, welcomes a recent finding that suggests Scottish agricultural research is the best in the world

SCOTLAND IS FORTUNATE in that over the years it has been a 'hotbed of genius' contributing the science that underpins all of the nation's economy. The SCRR aims to foster collaboration between all these institutions, bringing together foresters with geologists, ecologists with plant scientists, agriculturalists with social scientists.

It is this cross-disciplinary approach that will enable research in the rural environment to remain vibrant within the global research arena.

With some 75 per cent of Scotland's landmass under agricultural production, this generates around £2.3 billion a year and contributes massively to Scotland's £400 million food exports. It is therefore very pleasing to note that the research that supports the agricultural industries is first in the world based on the number of times the research is quoted in other research papers. This research emanates from the excellence of the Scottish research based within its universities and research institutes.

So much of rural research is interconnected that this cross-disciplinary approach is more important than ever. The farming community needs to make use of the research done into soils and how these sustain the Scottish landscape. Equally, we need to fully understand the impact of various styles of forestry management on our landscape, and how changes in the environment and climate of Scotland might affect indigenous species.

There is much for rural research to do; based on the excellence of Scotland's universities and research institutes.

This issue in places

Oban was the venue for the first meeting of the Scottish Rural Parliament in November – **page 2**

Galloway and Southern Ayrshire is home to Scotland's first UN Biosphere Reserve – **page 3**

Sindh, Pakistan is the location of a Scottish Government-funded project to protect communities from natural disasters – **page 4**

North of Shetland you will find the largest marine protected area in the EU – **page 7**

In Arran and Islay whisky is being distilled using malt from an ancient Scottish cereal – **page 10**

Half a kilometre under Northumberland the flora and fauna of 350 million years ago are being explored – **page 10**

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

Scottish Rural Action; Scotland's Rural College (SRUC)

Scottish Rural Parliament meets for the first time

Inspired by the success of rural parliaments in Europe, the Scottish parliament aims to be a strong voice for Scotland's rural communities

ON NOVEMBER 6–8, 2014, in Oban, Argyll and Bute, the inaugural Scottish Rural Parliament brought together 400 community people and decision-makers from public bodies, NGOs and private bodies, with the aim of improving rural policy and finding better ways of providing services.

Local Rural Parliament events involving members of the public had previously taken place throughout Scotland by way of preparation, and these contributed to the discussions.

Discussion workshops were held on the following key themes:

- Communities leading with confidence;
- Health and social care;
- Land use, planning and land reform;
- Transport infrastructure;
- Transport and business;
- Broadband and digital connectivity;
- Protecting our natural assets;
- Adapting to environmental change;
- Governance of the Rural Parliament;
- Rural businesses and employment.

Above: Oban, where the Rural Parliament met for the first time in November 2014. Right: the logo of the new organisation

Additional discussions took place on topics raised by participants in fringe meetings throughout the town. Reports of the contributions and proceedings may be viewed through social media and soon on the Scottish Rural Parliament website.

Scottish Rural Parliament: www.scottishruralparliament.org.uk/

Where should rural Scotland be in 2035?

An event in Edinburgh discussed the need for a national vision. This report from the SRUC Rural Policy Centre

PHOTOGRAPH : SRUC

'RURAL SCOTLAND REFOCUSED', an event in Edinburgh on October 28, 2014, involved more than 80 representatives from organisations involved with rural communities. They came together to discuss where rural Scotland should be in 2035.

The meeting was inspired by SRUC's recent 'Rural Scotland in Focus' report that highlighted the need for an overarching strategy for rural Scotland and called for a new vision. The event featured workshops on key themes highlighted by our reports of 2010, 2012 and 2014, namely:

- poverty and disadvantage;
- agriculture, food and land use;
- community empowerment;
- young people and towns;
- thriving economies.

Left: Dufftown's main street

There was a clear consensus around the need for a national vision, with regional and local strategic implementation, ensuring local people are engaged and empowered. Also important is the need for urban and rural sectors to work together.

In the evening, a panel session with four MSPs who have a well-known interest in rural affairs answered questions raised by the afternoon workshops. Discussing rural poverty, the MSPs paid tribute to the evidence provided by the SRUC report.

The work generated from the day was gathered together and general findings taken to the inaugural meeting of the Scottish Rural Parliament.

More details from www.sruc.ac.uk/downloads/download/828/2014_rural_scotland_in_focus_report

Scotland's first 'biosphere reserve' gets climate ready

Workshops in Galloway and Southern Ayrshire look at adaptation, says Ruth Wolstenholme of Sniffer

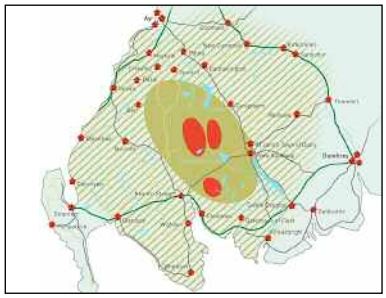
THE GALLOWAY AND SOUTHERN AYRSHIRE Biosphere, a first for Scotland, is a groundbreaking project to protect the biological and cultural diversity of a region while promoting sustainable economic development.

Biospheres are places with world-class environments that are designated by the United Nations to promote a balanced relationship between people and nature. Adaptation Scotland is working with the Galloway and Southern Ayrshire Biosphere Reserve to run the 'Climate Ready Biosphere' project within this context.

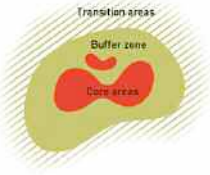
A series of three workshops is looking at the impacts of a changing climate on the Biosphere Reserve and aims to identify next steps in working towards a Climate Ready Biosphere.

Right: traditional livestock at the Stewartry Show; farmers may need to adapt to the area's changing climate

COURTESY OF GALLOWAY PHOTOGRAPHIC COLLECTIVE



Galloway and Southern Ayrshire Biosphere Reserve



The first introduced adaptation to participants representing public sector, businesses and communities. It looked at consequences already being felt in the Biosphere and identified initiatives under way to build resilience to climate change and explored how stakeholders could work in partnership.

The second workshop focused on climate change adaptation in the region and included some fantastic case studies demonstrating how local businesses and public agencies are changing their delivery of products, services, investment and support in response to a changing climate.

Read more about the project at www.adaptationscotland.org.uk/3/192/0/Climate-Ready-Biosphere.aspx

IPCC 5th Assessment Synthesis Report

Extracts from the report of November 2014, selected by Alastair A Macdonald of SCRR

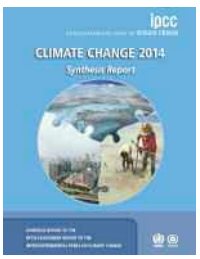
1.2.2. GLOBALLY, economic and population growth continue to be the most important drivers of increases in CO_2 emissions from fossil fuel combustion. The contribution of population growth between 2000 and 2010 remained roughly identical to that of the previous three decades, while the contribution of economic growth has risen sharply (high confidence).

2.2. Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and global mean sea level to rise.

2.3. Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.

3. Adaptation and mitigation are complementary strategies for reducing and managing the risks of climate change. Substantial emissions reductions over the next few decades can reduce climate risks ... increase prospects for effective adaptation, reduce the costs and challenges of mitigation in the longer term, and contribute to climate-resilient pathways for sustainable development.

4.1. Adaptation and mitigation responses are underpinned by



common enabling factors. These include effective institutions and governance, innovation and investments in environmentally sound technologies and infrastructure, sustainable livelihoods, and behavioural and lifestyle choices.

4.3. The most cost-effective mitigation options in forestry are afforestation, sustainable forest management and reducing deforestation, with large differences in their relative importance across regions. In agriculture, the most cost-effective mitigation options are cropland management, grazing land management, and restoration of organic soils.

See www.ipcc.ch/report/ar5/syr/

Members' reports

University of Glasgow

Natural disasters and food security in rural Pakistan

Two projects funded by the Scottish Government are showing promising results. The work is led by Yasmeen Lari of the Heritage Foundation of Pakistan, and Azra and Peter Meadows of the University of Glasgow

Left: Darya Khan Shaikh Village, Khairpur, Sindh. Flood resistant communal village hall on stilts, with permaculture of local vegetables surrounded by a dry brush-wood fence that deters goats and cattle

IN 2005, PAKISTAN suffered one of the most destructive earthquakes ever recorded. Then in 2010, 2011 and 2012 unprecedented floods swept the country. These events set the country's development back at least a decade. There was loss of life, destruction of property, and large-scale loss of livestock and agricultural crops that led to food security being nationally compromised. In 2010, the Scottish Government International Development Fund funded two projects, to Glasgow University and Heritage Foundation Pakistan, which addressed these issues in Khyber Pakhtunkwha.

The first project focused on building emergency homes for displaced families. More than 250 new homes were built in Swat Valley over six months. These are ecofriendly low-cost units built on a guided self-help basis with locally available bamboo and lime mud daub.

The second project, which has run for three years, has provided disaster rehabilitation, management and guidance to rural communities in Siran Valley. It has educated women and children in hazard preparedness, and assisted families to develop livelihood programmes. These latter include clean water, community food programmes, novel village-based agriculture systems such as permaculture, and the development of a 'Disaster Preparedness Manual'.

The two projects have been so successful that they are now being implemented with rural communities in coastal Sindh.

Scottish Science Advisory Council to seek new members

Application process delayed until early 2015 to await the appointment of a new Chief Scientific Adviser

THE SCOTTISH Science Advisory Council (SSAC) provides independent advice and recommendations on science strategy, policy and priorities to the Scottish Government's chief scientific adviser for Scotland (CSA). It is a broadly based group, including both practitioners and users of scientific innovation. The SSAC advises on a broad range of scientific issues and science-related policies that will contribute to growing the economy and raising quality of life in Scotland.

The Council's members are respected senior figures drawn from right across the science, business and academic communities and as a result will be an effective conduit between the SSAC and the science communities that make up the science base in Scotland and further afield. Appointments to the SSAC, which do not receive any remuneration, are made for a three-year period, renewable for a further two. The appointments are made following a public advertisement and selection process. All appointments are made on merit and in order to achieve a balance across the scientific community.

A number of SSAC members will step down in January 2015 as their term of membership has come to an end. The decision has been taken to delay the process of recruiting new SSAC members until a new chief scientific adviser for Scotland has been appointed (the current CSA, Prof Muffy Calder, is stepping down to become head of the College of Science and Engineering at the University of Glasgow.

For further information or if you would like to be notified when SSAC will open the application process again please contact the SSAC secretariat.

SSAC: www.scottishscience.org.uk/scottish-science-advisory-council

Food security: there is already hunger in Scotland

Can rural research contribute to a solution? Heriot Watt University and the University of Glasgow

Contributions to a food bank pile up in a Glasgow square

RESEARCH IS being conducted in universities and research institutes throughout Scotland to identify a range of potential ways of tackling food security issues at a national and international level as the world's human population rapidly increases from the current 7.2 billion towards the figure of 9.6 billion expected by the United Nations in 2050.

Recent research has indicated that various aspects of this problem have arrived locally already. The recent Poverty and Exclusion in the United Kingdom Project found that one in four adults in Scotland (25 per cent) have skimped on their own food in the past year so that others in the household may eat and that 30,000 Scottish children live in families who cannot afford to feed them properly.

These findings show that over a quarter of a million children and adults aren't properly fed (two meals a day for adults, three for children; fresh fruit and vegetables daily for both; meat, fish or vegetarian equivalent every other day for adults, daily for children). The distribution of rural poverty in Scotland indicated by the recent child poverty map of Scotland suggests that hunger is distributed throughout all the local authorities of Scotland, rural and urban. How might rural research contribute towards finding the solution of this Scottish food problem?

End Child Poverty, including the child poverty map of Scotland: www.endchildpoverty.org.uk/why-end-child-poverty/poverty-in-your-area

Poverty and Exclusion in the United Kingdom project: www.poverty.ac.uk

Fuel poverty, fracking and the effects on our communities

Murdo Macdonald of the Science, Religion and Technology Project (SRTP) says the Church must watch this issue

ONE OF THE ITEMS that is currently of great concern to many in our communities, including the Scottish Government and the Church of Scotland, is fuel poverty. This can be a particular problem in rural areas, where there is limited access to cheaper fuels such as gas.

One of the novel elements in the mix is shale gas. The extraction of this, often by unconventional means such as fracking, has been the source of much controversy – not least in rural Scotland. There have been a number of recent reports which have sought to analyse the extent of the reserves of shale gas in Scotland, and also to make recommendations as regards the extraction. Many accept that extraction is likely to happen, but would seek to limit the areas in which fracking takes place. For example, a report by a consortium of a number of organisations, including the RSPB and the Wildfowl and Wetlands Trust, recommends that much of rural Scotland should be protected from fracking (for details, see the Summary Report at www.rspb.org.uk/fracking).

The Church has recently been involved in a series of meetings in various parts of Scotland to discuss fuel poverty. There has been no unequivocal acceptance or rejection of fracking as a source of gas, but a persuasive issue in discussion has been the dependence of most homes in Scotland (over 75 per cent of all households) on gas for heating. While many participants were concerned about the local environmental impact of fracking and equally about climate change, the decline of North Sea gas supplies and growing dependence on imported gas gave others pause for thought.

Wood's good: but three-quarters of Scottish households use gas for heating

The Church is concerned to understand the issues in rural Scotland. The acknowledged concerns around unconventional gas extraction need to be balanced with our concerns for those in our rural communities who face real hardship as a result of fuel poverty.

Having a presence in every community in Scotland puts the Church in a place of unique privilege – and also unique responsibility.

SRTP: www.srtp.org.uk

Members' reports

Scottish Association for Marine Science (SAMS)

Fishing for thraustochytrids with pollen for bait

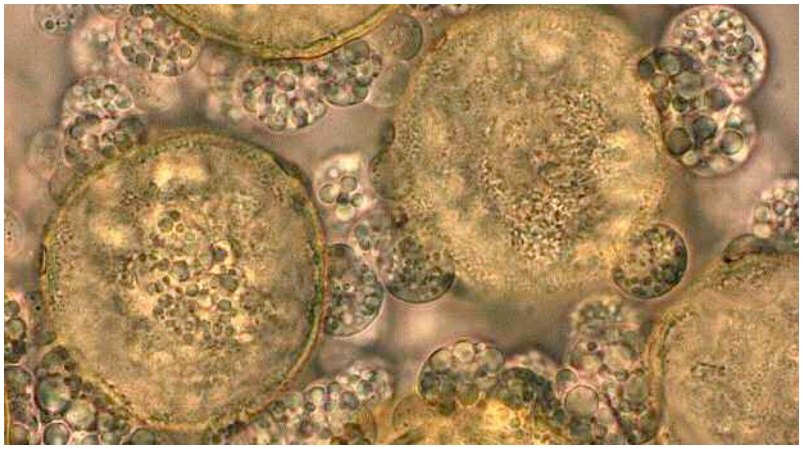
David Pond of SAMS explains his research into a little-known group of microscopic marine organisms

THRAUSTOCHYTRIDS are an important yet little studied group of microbial, marine decomposers. They are an enigmatic group of marine protists, increasingly exploited by the food industry as a source of lipid, rich in omega three fatty acids, for human consumption and animal feeds.

Although they are ubiquitous in the marine environment, our knowledge of protist ecology is limited. It is thought that they fulfil a similar role to bacteria, being major decomposers of organic material. Their biomass in the marine environment can often exceed that of bacteria, suggesting a major, yet largely unstudied role in nutrient regeneration and decomposition of organic material.

Specific strains of thraustochytrids are often intimately associated with a wide range of invertebrate taxa including sponges, hydroids, bivalves and zooplankton. An extraordinary feature of thraustochytrids is their propensity to accumulate high quantities of lipid, which at times can exceed 70 per cent of the dry mass of culture biomass.

Right: colonies of thraustochytrids on the surface of walnut tree pollen. The microbial colonies produce an endoplasmic net to 'mine' the nutrients in the pollen



Working in collaboration with Dr Silvina Rosa (University of Buenos Aires) I have started a research programme into the ecological role of thraustochytrids in the Scottish coastal environments and have isolated 20 strains of thraustochytrids. The isolation technique involves 'fishing' for the microbes using plant pollen as a bait: after a couple of days, pollen added to a seawater sample is colonized by the microbes. Pollen from walnut trees is the most effective.

Horizon scanning and early warning systems for the detection of marine invasive species

Elizabeth Cook of SAMS on the steps being taken to stop invaders from establishing themselves in UK waters

INVASIVE NON-NATIVE species (INNS) are considered to be one of the greatest threats to biodiversity, particularly through their interactions with other drivers of change. Initially transported through human intervention outside their natural range and across ecological barriers before becoming established in a new location, they can have negative impacts on the ecology as well as have serious economic and social impacts.

Some 58 of these invasive species are established in the UK, with an estimated cost of at least £40 million per annum to marine-based industries.

The team at SAMS is now involved in national and European-based programmes that address three types of intervention: prevention; early warning and rapid response; and management. These have led to the development of marine biosecurity guidelines for INNS, the assessing of techniques for the early detection of marine INNS, and the publication of the Marine Climate Change Impacts Partnership report on INNS.

Left: assessing settlement panels for their effectiveness as an early warning for Invasive non-native marine species. Right: wireweed, Sargassum muticum

PHOTOGRAPH: GRAÇA GASPAR VIA WIKIPEDIA

New Marine Protected Area designations for Scotland

The Scottish Government has named 30 new protected areas, some extensive. Ben James of SNH reports

SCOTLAND'S ICONIC marine species and habitats are now better protected following the designation of 30 new Nature Conservation Marine Protected Areas (NC MPAs) on July 24, 2014. These are incorporated into the National Marine Plan alongside existing protected areas. One of the sites – the North East Faroe Shetland Channel – is estimated to be the largest Marine Protected Area in the EU.

The new MPAs will protect a range of habitats and species including flame shell beds, feather stars, the common skate and the ocean quahog, a large mollusc which can live for centuries. They will also protect sand eels – a small fish that many seabirds and marine mammals depend on for food – and black guillemots.

The 30 new sites contribute to a network to conserve rare or representative species and habitats, allowing them to remain healthy and productive as well as to recover more sensitive species and habitats to a more natural condition. The network will be managed to protect the features for which they have been designated.

Where possible that management will also allow sustainable use of the sea by marine users including the fishing industry.

Ministers have also announced they are considering 14 new Special Protection Areas to protect seabirds and a further four NC MPAs to protect basking sharks and species of whale and dolphin. These areas have been identified by Scottish Natural Heritage (SNH) and the Joint Nature Conservation Committee (JNCC) through a programme of research and survey. Ministers will consider this advice in detail and these areas may be the subjects of formal public consultations in due course.

More details: www.scotland.gov.uk/topics/marine/marine-environment/mpanetwork

Below right: a flame shell and its native reef

PHOTOGRAPHS: G SAUNDERS

Metabarcoding to assess impacts on diversity

Dr Tom Wilding of SAMS describes an accurate and cost-effective way to monitor the sediments near fish farms

FISH-FARMS cause change in the sediment surrounding them. Consequently, the licensing authority (the Scottish Environmental Protection Agency, SEPA) obliges fish-farmers to conduct monitoring to ensure that any changes do not exceed agreed levels. Traditionally, this has included an assessment of the diversity of organisms living in the sediments (benthos) surrounding the farm.

Benthic diversity is determined by washing collected sediment through a 1mm sieve, identifying and then counting all the retained organisms. Generally five samples per farm are required, and this is expensive; every year the Scottish fish-farming industry spends approximately £2 million on statutory monitoring.

In the field, at sea: collecting samples for analysis

Together with Jan Pawlowski (University of Geneva) and Tomas Cedhagen (Aarhus University) we are developing 'next generation sequencing' techniques to assess changes in benthic community diversity. We are using 'DNA fingerprinting' to assess the diversity of organisms present in sediment samples from around fish-cages.

Initial results look very encouraging. We found a highly significant correlation between 'DNA diversity' and traditional predictors of diversity. Metabarcoding may offer a highly accurate, cost-effective and commercially viable alternative technique for assessing impacts around point sources such as fish-farms and sewage outfalls.

Members' reports

James Hutton Institute; Forest Research

Stress-busting properties of a walk on the wild side

Provided you do it in company, that is. Bernardo Rodriguez-Salcedo of the James Hutton Institute explains

GROUP WALKS in nature are associated with greater mental wellbeing as well as lower depression and stress, an article co-authored by Dr Katherine Irvine has concluded.

Researchers studied 1,991 participants in the Walking for Health programme, matching group walkers and non-group walkers on such characteristics as age, gender, ethnicity, education and previous physical activity in order to ensure that the only difference between the two groups was their participation in group walks.

People who had recently experienced stressful life events, like a serious illness, death of a loved one, marital separation or unemployment, especially saw a mood boost from outdoor group walks.

Dr Irvine said: "With the increase in mental ill health and physical inactivity in the developed world, it is important to find accessible, relatively simple ways to help people improve their long term quality of life and well-being.

"We have all at one point or another been told that 'getting outside' or 'taking a walk' are good for us. Besides having exceptionally beautiful natural environments, Scotland is undertaking important initiatives to bring nature into our urban areas. This study suggests that making the time to take a group walk in those natural areas – be they a local park or further afield – could be a wonderful stress-buster."

COURTESY OF GALLOWAY PHOTOGRAPHIC COLLECTIVE

A walking group in the Merrick Hills, Dumfries & Galloway

Recognising seedlings? There's an app for that

Four years of detailed work have gone into a practical new piece of software from Forest Research

PHOTOGRAPHS: FOREST RESEARCH

Left to right: Betula spp (birch), Rubus fruticosus (bramble) and Rosa spp (wild rose)

THE LATEST Forestry Commission app is designed to aid the identification of the seedlings of woody species commonly found in UK woodlands. Behind the tech lies four years' worth of painstaking horticulture, botanical observation, and image capture. One of Forest Research's aims was to capture the full range of seedling development from cotyledons (seed-leaves) to the emergence of mature foliage. To ensure correct identification of the seedlings it used seed collected from known parents and determined the features which could be used to identify them.

Researchers pinpointed key differences between superficially similar seedlings. For example, birch (Betula spp), bramble (Rubus fruticosus agg.) and wild rose (Rosa spp.) all have small, oval cotyledons, but only Betula spp. have hairless margins. And in Rubus the first leaf has many glandular hairs, whilst that of Rosa only has them on its stem and underside.

With careful preparation of material, and a few minor modifications to an off the shelf flatbed scanner, this produced the majority of high-resolution images seen in the final App.

The app covers nearly 100 species and is designed for iPhone, iPad, and Android devices.

More details at: www.forestry.gov.uk/newsrele.nsf/web-allbysubject/036C8CE2FE8271BF80257D56004CA9CC

PHOTOGRAPH: ALISTAIR BAXTER

Effects of environmental change on a montane specialist bird, the dotterel

Steven Ewing of RSPB reports on another bird whose numbers are declining

MONTANE HABITATS are some of the least spoilt natural ecosystems remaining in Scotland, but even these are subject to several threats, including climate change, nitrogen deposition and overgrazing. The challenges of working in remote mountain environments, however, means that the impacts of these on specialist montane plant and animal communities are poorly known.

Above: the dotterel, a small plover

RSPB, in conjunction with partners, is carrying out a programme of research to understand the effects of changes in the montane environment on the dotterel, one of the few bird species adapted to breeding in these habitats. These small plovers winter in the semi-deserts and steppes of North Africa, and return to Scotland in migrating 'trips' in April, settling in areas dominated by Racomitrium moss heaths or Juncus trifidis heaths.

In 2011, RSPB/SNH carried out a national survey of dotterel covering more than 50 per cent of montane habitat in the UK. This showed that dotterel have declined sharply by 57 per cent since the 1980s (from 980 to 423 breeding males).

RSPB is working with PhD student Alistair Baxter and Rene van der Waal of Aberdeen University to investigate the climatic, topographic and environmental correlates associated with population change at montane sites. An additional component of Alistair's PhD has been to examine patterns of habitat selection and breeding success of dotterel at intensive study sites, repeating work that was initially carried out by SNH in the 1980s. We are hopeful that this work will yield key insights into the impacts of environmental change in montane areas on dotterel, with wider relevance for other cold-adapted plants and animals.

Peatland restoration and ecosystem service valuation

The UK's peatlands need repair and the carbon benefits alone may justify the cost, says Dominic Moran of SRUC

MORE THAN 80 per cent of UK peatlands are degraded to some extent and their widespread restoration could contribute to meeting various climate change, water quality and biodiversity policy challenges. Economic analyses of costs and benefits are hampered by scientific uncertainty; there is a lack of data on biophysical conditions as well as the impacts and costs of restoration.

The construction of a simple 'ready-reckoner' allows exploration of possible net economic benefits under different combinations of 'What if?' assumptions for key restoration parameters[1]. The results strongly suggest that a narrow focus on carbon benefits alone is sufficient to justify restoration in many cases. The inclusion of possible additional non-carbon benefits reinforces this.

Peat moor that is heavily degraded would almost certainly be worth repairing

PHOTOGRAPH: SRUC

However, the results are sensitive to the assumptions made. It would be helpful to have better data for the restoration costs associated with modest emission savings from lightly degraded sites. Further research is needed. Attention also needs to be paid to policy mechanisms for encouraging restoration: a mix of mechanisms is likely to be needed to raise awareness of the rationale for and the practicalities of restoration, and to incentivise or oblige land managers to adjust management practices.

(1) Moxey, A and Moran, D (2014) Science of the total environment, 484, 114-120.

Members' reports

Orkney College, UHI; British Geological survey and National Museums Scotland

Whisky helps to conserve an ancient Scottish crop

Bere barley is used by two distilleries in a distinctive new dram, says Peter Martin of Orkney College, UHI

AFTER SEVERAL YEARS of maturation, two new single malt whiskies are being released in November 2014 both of which are made from bere, an ancient type of Scottish barley.

These whiskies result from collaborations between the Agronomy Institute at Orkney College, University of the Highlands and Islands, and Isle of Arran Distillers and Bruichladdich Distillery and demonstrate that old crops can still be very valuable to today's commercial companies. Moreover, the development of new markets for such crops allows farmers to earn an income from growing them and helps to ensure the on-farm survival of these crops. This is important for conserving them as a genetic resource and allows them to continue to adapt to changing conditions. Bere was once the staple barley grown throughout much of Scotland and was made into meal for baking and malt for producing both beer and whisky. It was particularly suited to the challenging environment of the Highlands and Islands and, in this region, was especially important to early distillers (both legal and illegal). As farming practices changed and higher yielding, easier-to-grow varieties became available, bere fell out of favour and is nowadays only grown by a small number of farmers in the Northern and Western Isles. Recognising that the survival of bere on farms could be helped by finding new markets for the crop, the Agronomy Institute started to collaborate with distilleries and breweries in 2004. These whiskies are proof that this very important heritage crop still produces an exciting and distinctive dram.

Isle of Arran (left) and Bruichladdich bere whiskies

Drilling half a kilometre through Romer's Gap

The TW:eed project borehole near Berwick-upon-Tweed is exploring the flora and fauna of the distant past, explain Dave Millward and Nick Fraser, British Geological Survey and National Museums Scotland

A FULLY CORED BOREHOLE has been drilled to a depth of 501m through Lower Carboniferous (Tournaisian) rocks of the Ballagan Formation near the village of Norham, near Berwick-upon-Tweed. The resulting cores contain a continuous high-resolution record of the lithology, sedimentology, petrology, stable isotope compositions, palynostratigraphy and biostratigraphy.

A key objective for the TW:eed (Tetrapod World: early evolution and diversification) project was the investigation of Romer's Gap, the time when the aquatic and fish-like limbed vertebrates of Late Devonian times emerged on to land. This was the step change in the evolution of life on Earth that shaped the future of all vertebrates. South-east Scotland is only one of two places in the world where tetrapod fossils from Romer's Gap have been found – the other is Blue Beach in Nova Scotia, Canada.

The 500m of cores are providing a wealth of detail illustrating the dynamic nature of the environment during Early Carboniferous times. As the full picture of this environment emerges, we will have a much better understanding of the life and death of these early terrestrial tetrapods.

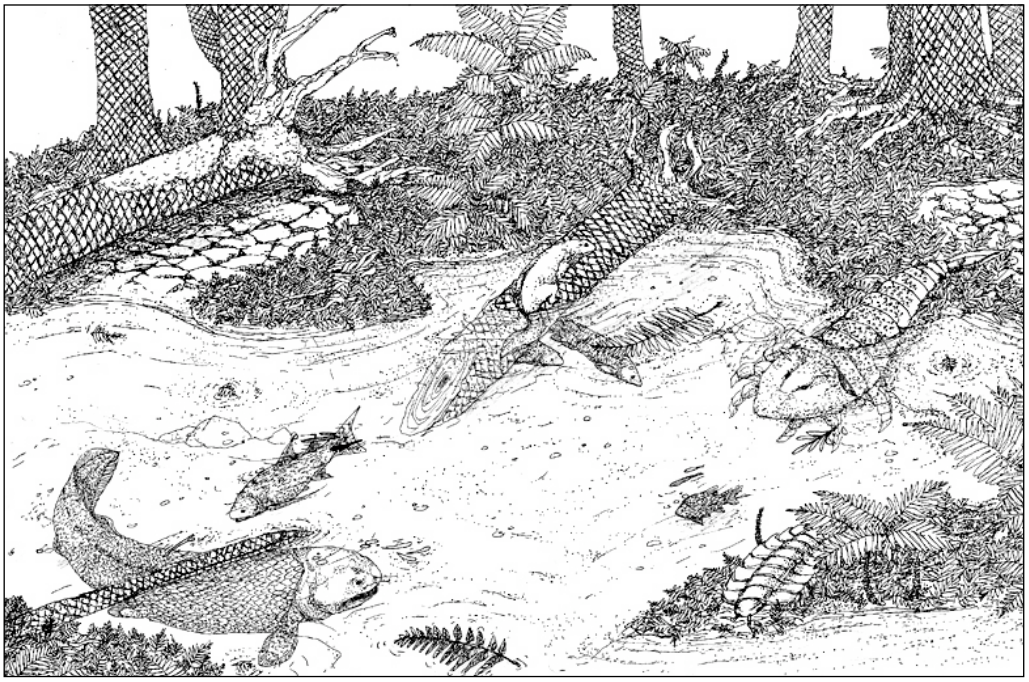


ILLUSTRATION © YASMIN YONAN

This image shows what the lake and forest environment might have looked like, along with members of the animal community. The tetrapod shown on the fallen giant clubmoss trunk is 300-360 mm from head to tail. The very large lobe-finned fish (lower left) is a Rhizodont, probably up to 1 metre in length. Near to this is a gyracanth with its long fin-spines, reaching about two-thirds that size. Both were major predators. Ray-finned fish (below right of tetrapod) were probably no longer than about 80mm. Large arthropods are shown. The millipedes are detritivors, processing the dead vegetation. The eurypterids ('sea-scorpions') are an extinct group related to arachnids: some were very large (centre right).

Talking Science to people

Royal Botanical Gardens of Edinburgh and Forest Research

IMAGE: FOREST RESEARCH

OVER THE EARLY part of the summer, staff from Forest Research teamed up with those from Royal Botanic Garden Edinburgh to attend various events as part of the Talking Science project, designed to bring science topics to new audiences in different places.

One such event was the TweedLove cycling festival in Peebles, where we set up as part of the Enduro World Series event. For this event we focussed on tree disease and the importance of cleaning bikes to help stop or slow down the movement of such disease (e.g. Phytophthora ramorum). To help attract interest in the stand, we used a wooden 'sandwich bike', a self-build kit with frame and forks made from beech plywood. It certainly drew the crowds!

Teacher training in the woods

AT THE END OF AUGUST, staff from Forest Research joined with colleagues from Forestry Commission Scotland on an event in Glentress Forest (Peebles) for PDGE students from Moray House School of Education at the University of Edinburgh.

The students were future Chemistry, Biology, Physics, Design and Technology and Geography high-school teachers. The event was the start of the third year of working with Moray House students, aimed at introducing students to trees, woods and forests and the potential links with their curriculum areas. The students work on this project throughout their year of training.

SCRR seeks new Secretary/Treasurer

We're in (fairly urgent) need of someone to take over the day-to-day running of the consortium

THE SCOTTISH CONSORTIUM FOR RURAL RESEARCH comprises 25 research institutes and universities throughout Scotland, with more exploring the possibility of joining. The SCRR is in good heart and is looking forward to the future.

A replacement is sought for Alastair Macdonald who is stepping down from the position in order to attend to unexpectedly substantial home reconstruction work.

Duties are as follows.

1. Arrange dates and venues for bi-monthly Directors' Research Lunches.

2. Arrange dates and venues for Main Board and Executive Committee meetings.

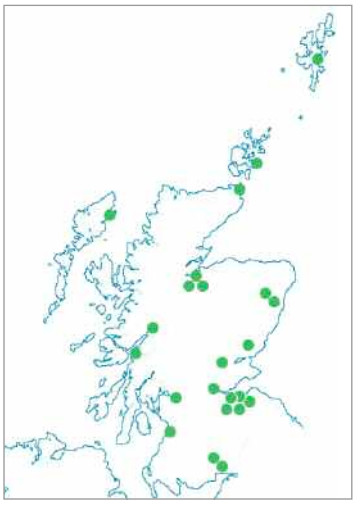
3. Prepare agendas and papers for Board and Executive Committee meetings and keep minutes.

4. Maintain SCRR accounts: issue invoices for subscriptions, events, etc. Verify and pay incoming invoices; prepare end of financial year accounts for inspection; prepare budgets; prepare Treasurer's reports for the Executive Committee and Main Board.

5. Maintain an up-to-date diary of 'Forthcoming events' for distribution to members.

6. Maintain the SCRR website.

7. Call for, co-ordinate and edit the submissions from the Consortium members to the SCRR Newsletter three times each year; one for distribution at the time of the annual lecture, one for distribution at the time of the 'Highland Show' and one in the autumn. Oversee layout, printing and distribution of the SCRR Newsletter.



The SCRR has 25 members based throughout Scotland

8. Support the Scientific Director with receptions, lectures, research meetings, fora and other events.

9. Act as a reference point for enquiries to the SCRR.

10. Carry out other duties as delegated by the Executive Committee.

Time: approximately 35 days per year.

If you are interested in the position, or would like to find out more about it, please contact the Chairman of the Executive Board, Prof Steve Yearley, by email – steve.yearley@ed.ac.uk.

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
Field Studies Council, Millport . . . . . enquiries.sco@field-studies-council.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
Lews Castle College, Stornoway . . . . . www.lews.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

WEDNESDAY JANUARY 14, 2015
British Geological Survey,
Murchison House, West Mains Road,
Edinburgh EH9 3LA
11:00 SCRR Board Meeting and Directors' Research Lunch

Events

www.scrr.ac.uk/events.php

MONDAY FEBRUARY 9, 2015 • 6PM
SCRR Annual Peter Wilson Lecture, 2015
Professor Tim Benton, UK Champion for Global Food Security and Professor of Population Ecology, University of Leeds.
Royal Society of Edinburgh, George St;
www.royalsoced.org.uk. Booking required.

People at SCRR

www.scrr.ac.uk/about.php

Scientific Director:
Professor Stuart Monro
stuart.monro@dynamicearth.co.uk

Secretary/Treasurer:
Dr Alastair A Macdonald
alastair.macdonald@ed.ac.uk

COPY DEADLINE

The deadline for copy in the next issue is December 20th, 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.

CONTACT SCRR

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ON THE WEB

Back issues at www.scrr.ac.uk