

# in-lando

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*It may be doubted whether there are any other animals that have played so important a part in the history of the world as these lowly organised creatures.*

*Charles Darwin*

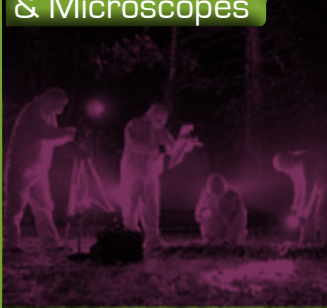
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## Inside this issue

Biofuels project in Malawi



Murder, Mystery & Microscopes



knowledgescotland  
Science Policy Connections Online

Knowledge Scotland



John Brown

# One Land: Many Options?

Land is a finite resource. With a growing world population and declining reserves of fossil fuels, the pressures on land to provide vital resources such as food and energy, have never been greater.

Land owners and policy makers in Scotland face many tough choices about how to best use our land into the future. Do we want to produce more food? More biofuels? More wind energy? More wildlife? More housing? More recreational areas? Many of these objectives compete and conflict. So what are the best options?

The Macaulay Land Use Research Institute is a main research provider to the Scottish Government and provides research and consultancy services to a wide range of organisations and individuals concerned with the sustainable management of natural resources in Scotland and internationally. Our staff of over 300 researchers and consultants provide the facts that support informed choices for the future of land use.

To find out more, please email us at [biggerpicture@macaulay.ac.uk](mailto:biggerpicture@macaulay.ac.uk) or visit [macaulay.ac.uk](http://macaulay.ac.uk)



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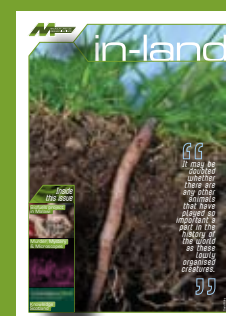
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"This issue of in-land contains many examples of our scientists' work to understand land use, environmental systems, the use and management of land and environmental resources, and promote sustainable relationships between society and resources in Scotland's varied environments."



The Macaulay Land Use Research Institute has a long history of scientific developments and insights that focus on links between society and environment. For example, the Soil Survey of Scotland collected fundamental data on soils and other environmental conditions across Scotland, and used the data to assess the capability of land for a variety of uses that support local communities and the Scottish economy.

This issue of in-land contains many examples of our scientists' work to understand land use, environmental systems, the use and management of land and environmental resources, and promote sustainable relationships between society and resources in Scotland's varied environments. At all times, we aim to ensure that the science we carry out can be applied to help develop and inform decision making, and be used by land managers and other stakeholders. We hear frequent cries for evidence-based or evidence-informed policy, and we are involved in regular discussions and workshops that bring together scientists and policy people.

To be effective, dialogue on the use of science for policy and decision making should not, however, merely be a two-way debate between scientists and policy makers. Rather it should be a conversation that must include a much broader range of society. At the Macaulay Land Use Research Institute, much of our science is developed in partnership with stakeholder groups, local communities, and organisations and individuals with specific interests in a particular place or issue, as well as with policy and other decision makers. This provides all partners with important benefits. The scientists benefit from hearing about issues and challenges as perceived by those who live daily with the consequences. Those from the communities with whom we work are given an

opportunity to explain the issues as they see them, and benefit from our commitment to working with them to understand the problems and provide science that addresses relevant issues. The policy- and decision makers benefit from the opportunities to make their own contribution to understanding the issues and formulating the science, from their own involvement with the communities and individuals making up the stakeholders, and from their participation in the scientific effort.

This edition of in-land includes information about the launch of KnowledgeScotland. The Macaulay Land Use Research Institute is committed to this initiative and emphasises the need to include not only scientists and policy-makers, but to build knowledge based on a three-way partnership of community involvement, scientific development and policy-maker participation. As part of our efforts to develop links between stakeholders and the communities for whom our science is intended, the Macaulay Land Use Research Institute is holding an 'Open Doors' event on 6th June this year. It's an opportunity for anyone with a professional or general interest in the work we do to find out more about our research programmes and the science we undertake. We hope to see you at the Open Doors event and I look forward to meeting you then.



*Richard*

Professor Richard Aspinall  
Chief Executive



David Riley

## New Board Members Appointed

Seven new members have been appointed to the Macaulay Land Use Research Institute's Board of Governors. The new Board Members are (left to right): Prof Alan Werrity, Julia Edgar, Dr George Paterson, Eric Baird, Shireen Chambers, Bob Kay CBE and Prof Nigel Curry.

They join Michael Gibson, Dr Laura Meagher, Prof Brian Clark, Helen Dickinson and Franceska van Dijk.



David Riley

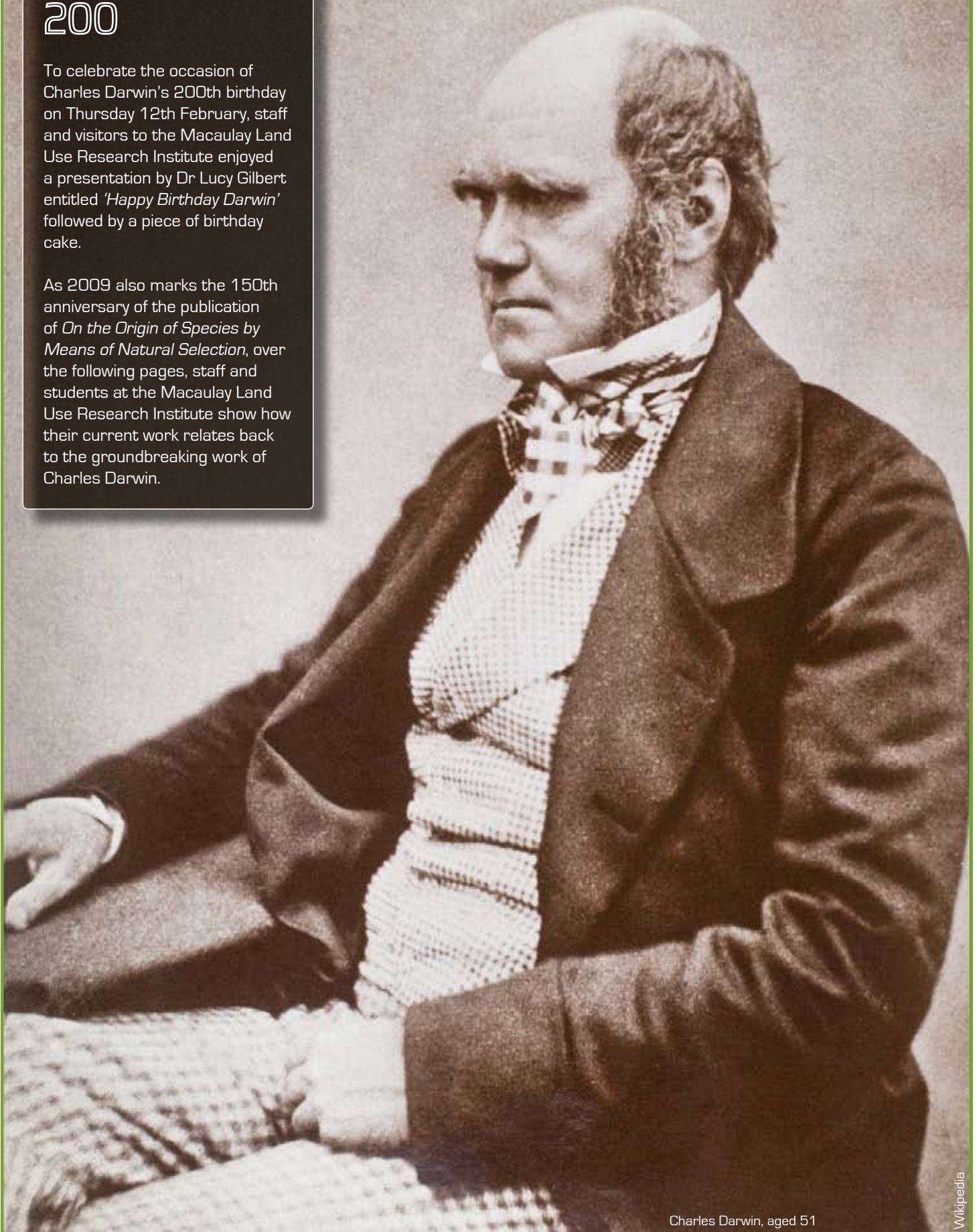
Commenting on the new appointments, Michael Gibson (pictured above), Chairman of the Board of Governors, said, "The seven new members are well-respected in their specialist fields and have a wealth of experience that spans forestry, life sciences, rural economy and planning, water law, and land management. The diversity of their knowledge and experience will prove to be very useful in moving forward the Institute's status as an international leader in land use research."

Prof Janet Sprent and Alisdair Laing join the Board of Trustees.

## 200

To celebrate the occasion of Charles Darwin's 200th birthday on Thursday 12th February, staff and visitors to the Macaulay Land Use Research Institute enjoyed a presentation by Dr Lucy Gilbert entitled 'Happy Birthday Darwin' followed by a piece of birthday cake.

As 2009 also marks the 150th anniversary of the publication of *On the Origin of Species by Means of Natural Selection*, over the following pages, staff and students at the Macaulay Land Use Research Institute show how their current work relates back to the groundbreaking work of Charles Darwin.



Charles Darwin, aged 51

# Celebrating Charles Darwin

## Understanding complex ecological systems : How Darwin still guides us in 2009

When Charles Darwin formulated his ideas on the origin of species, he was subject to criticism and ridicule, as his views represented an alternative to creationism. However, not only did he radically suggest that organisms, each with their own specialisms for a particular niche, evolved from others, but he also formulated precise hypotheses concerning how this came about, namely natural selection.

Although ecology is a mathematically and experimentally rigorous science, the complexity of natural systems, with multiple interacting components (species), makes them difficult to model and to predict. The Darwinian principles of natural selection remain highly relevant to modern ecological research, and represent the most pervasive means of ordering and predicting the responses of the species components of natural and semi-natural systems. For example, an understanding of the evolutionary relationships among species, and the extent to which their biology is genetically determined and 'hard wired', or varies with the environment, facilitates an approximation of how they might respond to a changing environment. And this is true whether the change is a rapidly imposed land-use change or a gradually changing climate.

If we are asked to predict how a changing environment will affect a resident species, then Darwin's theory provides a practical basis for addressing the problem. We would first ask, what are the species' food and environmental requirements, and will they be maintained, is that species or a related species living in a similar environment elsewhere, will it adapt to the new environment?

Darwin originated the often used analogy of the 'tree of life' which depicts the inter-dependence and evolution of species. However, his attention as a natural historian was not only directed towards the origin

of species, he was also interested in earthworms, and more importantly, their effects on the environment. In his book *The Formation of Vegetable Mould through the Action of Worms with Observations on Their Habits* (1886) he states '**...a weight of more than ten tons of dry earth annually passes through their bodies and is brought to the surface on each acre of land; so that the whole superficial bed of vegetable mould passes through their bodies in the course of every few years. It may**

**be doubted whether there are any other animals that have played so important a part in the history of the world as these lowly organized creatures'**. He clearly recognised the importance of ecosystem function, studies of which are currently enjoying resurgence 200 years after his Birthday.

Dr Glenn Iason  
Senior Ecological Scientist



Lorna Dawson

# CUSHIONS & CONDORS

## A TRIP TO PATAGONIA

Dr Rob Brooker, Plant Ecologist

At the end of 2008 I was headed for Patagonia, the southernmost portion of South America.

I imagine Darwin went to Patagonia because he had to - the Magellan Straits were the main shipping route around America at a time before the Panama Canal, and any global circumnavigation by the Beagle had no choice but to head south and around the southern tip of South America....



# Celebrating Charles Darwin

Rob Brooker



Wikipedia



My first reason for going was to teach on a course for South American students. The course, organised by Lohengrin Cavieres from the University of Concepción, northern Chile, focussed on plant ecology, and in particular on plant-plant interactions and environmental change.

The teachers on the course were an international team of plant ecologists with whom I've now been working for over 10 years. We each gave lectures on our specialist subjects - plants and climate change in my case - and, because of the location of the course in Coyhaique, central Chile, we were able to undertake field trips to a wide range of habitats and environments without large amounts of travelling.

One of the most interesting things for me was the steepness of the local environmental gradients. Drive one hour to the east of Coyhaique and you enter the arid systems of the Patagonian steppe, a result of the Andean rain shadow. Drive an hour west of Coyhaique and you drop down to the coast, and into temperate rainforest systems, whose plants are found in Chile, New Zealand and Australia and, according to fossil evidence, what is now Antarctica - a consequence of these land masses having been joined and then fragmenting during the break up of the ancient Gondwanaland.

My second piece of work was a fieldwork contribution toward a global study of the biodiversity impacts of cushion plants that our international research group is currently undertaking. One of the major northern hemisphere cushion plants is *Silene acaulis*, or moss campion. Although *Silene* grows in Scotland, for example at the Quiraing on Skye, it is not common in the UK. However, in many high alpine or arctic environments

across the globe, cushion plants are vital components of the flora. Their tough, dense foliage and low ground-hugging profile enable them to buffer the effects of the harsh environmental conditions found at such sites, both in terms of extremes of temperature and water availability, the latter being especially important in relatively arid systems such as the Andes. They also provide favourable microsites for the establishment and growth of many other plant species, and are central to regulating biodiversity in these environments.

The beneficial effects - also known as facilitative effects - of plants such as these cushions have received increasing interest by ecologists over the last 10-15 years, and more recently, the important role of beneficial interactions, particularly in extreme environments such as polar, alpine or desert systems, has been increasingly recognised. Our research examines how the role of facilitative and competitive interactions in plant communities changes with changing environmental conditions. This has important implications for understanding how key environmental processes and evolutionary drivers such as plant interactions might alter along environmental gradients, or as a consequence of large-scale environmental changes such as global warming.

Cushion plants, and their impact on the surrounding plant community, provide us with an excellent opportunity to explore this issue. To this end we're trying to collect a large dataset of cushion plant impacts from alpine ecosystems around the world, enabling us to link the cushion's effect on biodiversity to the prevailing environmental conditions. Being in South America seemed like too good an opportunity to miss in terms of adding to this dataset, and so we headed as far south as we could - to the Torres del Paine National Park.

As you head toward the poles the altitudinal limits of different vegetation zones gradually drop, and this meant that we didn't have to go particularly high in order to find the open treeless environments where the cushion plants grow. The walk up to these sites also gave us an excellent opportunity to explore the various habitats of the park, in particular the open meadow systems and *Nothofagus* woodlands that lie immediately below the treeline. I found that many of species were similar to those that I'd seen in both Scotland, and in northern Sweden where I'd spent three summers working on my PhD. Although they were often from different families, their growth forms and habits converged in order to deal with the common pressures exerted by the extreme environments in which they grow. And this, I think, illustrates a final important, but normally unwritten, reason for undertaking trips such as this. Travel, as they say, broadens the mind, and I personally feel that travel is an essential part of my work as an ecologist. Visiting new environments, such as Patagonia, challenges my preconceptions - breaking me out of a world-view moulded by our relatively productive temperate UK climate - and allows me to get a feel for the key processes regulating the evolution and ecology of plant species in different environments around the world. And yes, I did see some condors...

Rob



Rob Brooker

## The role of climate in determining species' distributions

*"Who can explain why one species ranges widely and is very numerous, and why another allied species has a narrow range and is rare?"*

*"In considering the distribution of organic beings over the face of the globe, the first great fact which strikes us is, that neither the similarity nor the dissimilarity of the inhabitants of various regions can be accounted for by their climatal and other physical conditions."*  
Charles Darwin, 1859.

### Was Darwin right?

Are the reasons why species live where they do and not in other places impenetrable mysteries; or are there patterns in the distribution of species that we can measure and explain? This fascinating question has puzzled curious naturalists for many years, but answering it has become increasingly urgent in our current times of climate change. Describing the distribution of species between continents, Darwin correctly rules out climate as an important factor in determining species' distributions, but within a continent most ecologists now believe climate to be the dominant factor affecting large scale distributions. And if this is so, then climate change is likely to result in a dramatic redistribution of species with unknown consequences for the ecosystems that we all rely upon for survival. Some changes in distribution have already occurred, but if we can answer Darwin's question we will have an important tool to predict the impacts of climate change and, most importantly, to act to reduce these impacts.

Dr Colin Beale  
Spatial Ecologist



# Celebrating Charles Darwin

Cereal leaf beetle, *Oulema melanopus*, a common pest on wheat.

In his autobiography Darwin wrote:

*"But no pursuit at Cambridge was followed with nearly so much eagerness or gave me so much pleasure as collecting beetles. It was the mere passion for collecting, for I did not dissect them and rarely compared their external characters with published descriptions, but got them named anyhow."*

*"I will give a proof of my zeal: one day, on tearing off some old bark, I saw two rare beetles and seized one in each hand; then I saw a third and new kind, which I could not bear to lose, so that I popped the one which I held in my right hand into my mouth. Alas it ejected some intensely acrid fluid, which burnt my tongue so that I was forced to spit the beetle out, which was lost, as well as the third one."*



Image courtesy of Gabor Pozsgai, an entomologist at the Macaulay Land Use Research Institute who has a keen interest in photography, especially insects. For more photos by Gabor, please visit [www.photogabor.com](http://www.photogabor.com)



Mank Elitton

**Local adaptation across a species range: coping with 'the serpentine syndrome'**

Northern rock-cress (*Arabidopsis lyrata* ssp. *petraea*, also known as *Arabis petraea*)



has a scattered distribution across Scotland, generally confined to mountain scree, rock crags and river shingle. Understanding how this plant adapts to specific conditions across its range, specifically the serpentine soil which forms part of its niche, provides vital information on how one species can adapt to different 'edaphic' conditions, how population differentiation can arise, and the potential of range-restricted populations to respond to environmental change.

Serpentine soils present difficult conditions for plant growth due to low levels of mineral nutrients, unfavourably high levels of Magnesium to Calcium, high levels of heavy metals and poor water availability. Such conditions promote differentiation

of populations as they develop strategies best suited to their localised environment. Furthermore, as soils are patchy in occurrence, opportunities for population mixing (and gene flow) are scarce and this could, over the long term, lead to speciation.

Using a 'fully-factorial' laboratory experiment to create transplant growing conditions similar to those of a natural growth environment, it will be possible to determine if plants collected from serpentine and non-serpentine soils show different adaptations, or better performance, according to the soil type in which they are grown. This aspect of the work addresses key questions, specifically: are adaptations in these populations specific to the occurrence on serpentine soils? And is this in the face of potential gene flow? Molecular markers will be used to determine the genetic connectivity of these populations and to look for regions of the genome that may highlight the candidate genes under differential selection.

This information will be used to inform our understanding of the response of plant populations to environmental variation and future environmental change. In this respect, I am working with Katja Schiffers and Justin Travis from the University of Aberdeen to develop a computer model that will assess how local adaptation affects the potential of plants to adapt to other environmental 'stimuli', such as climate change.

Liz Bourne, PhD Student



Liz Bourne

Supporting Scotland's Future in Science and Policy.

A novel approach to keeping policy makers in touch with the latest research on food, health, environment and rural sectors was launched in February .

The 'knowledgescotland' programme is designed to help scientists work more effectively with Government and others planning Scotland's future and is designed to change the culture of communication between the science and policy communities.

A programme of events, work shadowing, secondments and other forms of joint working will be supported by the knowledgescotland website, which carries interactive briefings allowing direct contact between scientists and those directly interested in policy.

Supported by Scottish Government, the initiative offers a focal point for researchers at SAC, the Macaulay Land Use Research Institute, the Moredun Research Institute, SCRI and the Rowett Institute of Nutrition and Health, University of Aberdeen.

Richard Lochhead, Cabinet Secretary for Rural Affairs and the Environment stated during the launch, *"The world-class research these organisations collectively provide is helping tackle major challenges. This exciting new initiative will help deliver key outputs from the scientific community. I am particularly pleased that the needs of policy makers for accessible, readily understood information has been recognised"*.

By registering at [www.knowledgescotland.org](http://www.knowledgescotland.org) you can receive regular policy briefings on research programmes, contribute comments, use policy related web links from the main research providers, and view the programme of events and activities.



Scottish Natural Heritage

Biodiversity Toolkit



Scottish Natural Heritage  
All of nature for all of Scotland



SCOTTISH  
BIODIVERSITY  
FORUM

The Scottish Biodiversity Forum and Scottish Natural Heritage have launched an online resource to help organisations talk to the public about Scotland's biodiversity.

The Toolkit aims to help organisations talk about the benefits of biodiversity in simple, clear language by providing key biodiversity messages, facts and figures, photographic images, case studies, document templates, and an events calendar.

The Toolkit has been guided by the Scottish Biodiversity Strategy - "Scotland's Biodiversity : It's In Your Hands" - [www.scotland.gov.uk/Publications/2004/05/19366/37239](http://www.scotland.gov.uk/Publications/2004/05/19366/37239)

The vision of the Scottish Biodiversity Strategy is for Scotland to be a world leader in biodiversity conservation where everyone is involved and everyone benefits. Importantly, the Strategy places people at the heart of successful biodiversity conservation. Its success also lies in the support of stakeholders delivering consistent messages about the advantages of conserving biodiversity.

The toolkit can be accessed at [www.snh.org.uk/biodiversitycommstoolkit/index.html](http://www.snh.org.uk/biodiversitycommstoolkit/index.html)

## Agroforestry at Glensaugh

Agroforestry research plots were planted at the Macaulay Land Use Research Institute's Glensaugh Research Station in spring 1988 to demonstrate reduction in livestock output in an integrated sheep grazing and woodland management (silvopastoral) system. The timber was viewed as an alternative, potential source of income.

Three tree species were selected and planted at different densities to compare their performance.

- Scots Pine (*Pinus sylvestris*) planted at a density of 400 trees per hectare (400/ha)
- Hybrid Larch (*Larix eurolepis*) planted at a density of 400 trees per hectare (400/ha)
- Sycamore (*Acer pseudoplatanus*) planted at density of 400/ha and 100 trees per hectare (100/ha)
- Control plots planted at conventional forestry densities (2,500 per hectare)

Greyface ewes with lambs were, and still are, free to graze in and around the trees between April and November.

By the time the experiment ended in 2001, there was no measurable reduction in sheep output. In addition, a new timber source had been created and a positive impact made on the landscape, and its biodiversity value.

## Glensaugh's self-guided agroforestry trail

Eight years on from the end of the trial and the original research plots still provide land managers with valuable information on agroforestry systems. Our research doesn't stop there: suckler cows were introduced to the Scots Pine plot in 2008 as part of an experimental grazing project to determine what benefits tree pasture will bring for the cattle and to identify any disadvantages to the trees.

To help explain the introduction of the integrated sheep grazing and woodland (silvopastoral) system at Glensaugh, and to outline how the site is managed today, a self-guided trail has been established. The trail offers visitors practical tips, and information on the potential benefits associated with this type of land management system.



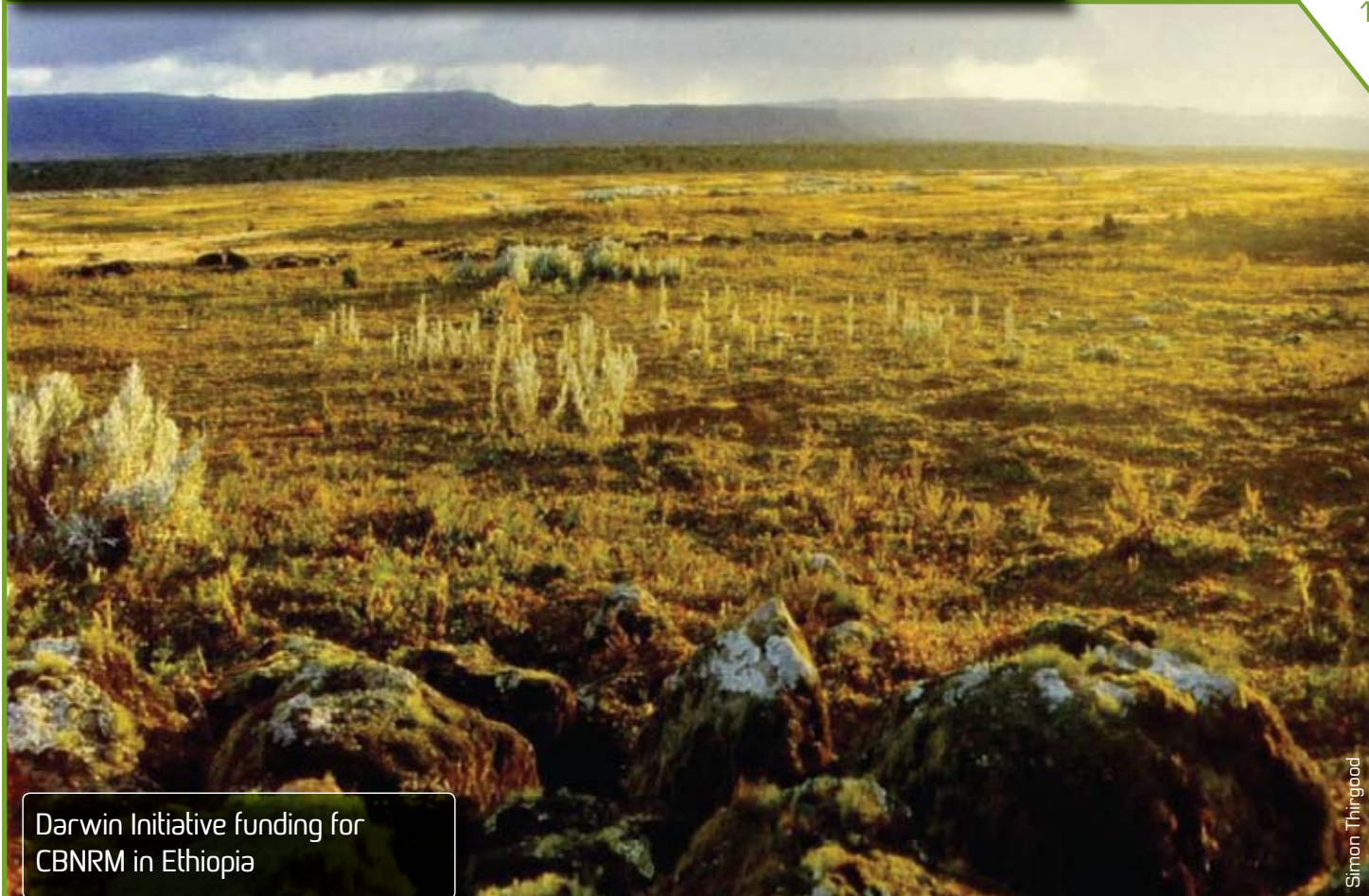
Copies of the trail and the associated map are available from  
 Donald Barrie,  
 Farm Manager  
 The Macaulay Land Use Research Institute  
 Glensaugh  
 Laurencekirk  
 AB30 1HB

or [www.macaulay.ac.uk/aboutus/researchstations/glensaugh](http://www.macaulay.ac.uk/aboutus/researchstations/glensaugh)



Donald Barrie

David Riley



Simon Thirgood

## Darwin Initiative funding for CBNRM in Ethiopia

Researchers from the Macaulay Land Use Research Institute have successfully applied for funding from the UK DEFRA Darwin Initiative to help build natural resource monitoring capacity in Ethiopia's key Afro-montane ecosystems.

Ethiopia's highlands harbour globally significant biodiversity including flagship species such as the mountain nyala and Ethiopian wolf – all of which are listed by the International Union for Conservation of Nature (IUCN) as Critically Endangered or Endangered as well as other endemic plant, amphibian and bird species. The highlands are some of the last intact afro-montane ecosystems in Ethiopia, as well as vital water towers supplying arid and semi-arid areas in Ethiopia, Somalia, Sudan and Egypt.

97% of the original habitat has been lost to human agriculture, grazing and unsustainable natural resource use. With resource-dependent local communities rapidly growing, unsustainable resource use continues to threaten conservation and human well-being in these

already impoverished areas. In order to implement biodiversity conservation and sustainability, local authorities, local communities and international non-governmental organisations are working towards Community-based Natural Resource Management (CBNRM).

As an integral component of this wider programme, the Macaulay Land Use Research Institute and a range of partners will be initiating a project entitled "Building natural resource monitoring capacity in Ethiopia's key Afro-montane ecosystems" with funding from the UK DEFRA Darwin Initiative. The aim of the Initiative is to assist those countries which are rich in biodiversity but poor in financial resources to implement the Convention on Biological Diversity (CBD) through the funding of collaborative projects which draw on UK biodiversity expertise.

The project will build the human and institutional capacity of protected area management authorities and community members to monitor community-based natural resource management in four key afro-montane areas – two national parks and two community-managed

protected areas.

The project is coordinated by Simon Thirgood from the Macaulay Land Use Research Institute and is a partnership between the Macaulay Land Use Research Institute, the University of Aberdeen, the Ethiopian Wildlife Conservation Authority, Wondo Genet College of Forestry and Natural Resources, Oromia Agricultural and Rural Development Bureau, Amhara Parks Development and Protection Authority, Bale Mountains National Park, Simien Mountains National Park, Guassa Community Conservation Area, Abune Yoseph Community Conservation Area, the local NGO Forum for the Environment and the International NGO Frankfurt Zoological Society.

The project has a budget of £553,991 with £290,768 funded by DEFRA and the remainder pledged as matching funds from the partners, including £40,340 from the Macaulay Development Trust. The project started in April 2009 with a CBNRM workshop and project initiation meeting in Addis Ababa.



## The Ploughman Poet

As 2009 hosts a wide range of events to mark the 250th anniversary of the birth of Robert Burns, Scotland's national poet, here we look back at his farming life and the influences the Scottish landscape made to his work.

Robert Burns was born on 25 January 1759 in Alloway, two miles south of Ayr. His father, William Burness (Robert Burns spelled his surname Burness until 1786) was a self-educated tenant farmer from a farm called Clochnahill in Dunnottar, and his mother Agnes Broun was the daughter of a tenant farmer from Kirkoswalk, South Ayrshire.

When he was seven years old his father sold the house and took the tenancy of a 70-acre Mount Oliphant farm, south-east of Alloway. By the time he was 15, Burns was the principal labourer at Mount Oliphant.

The young Robert Burns grew up surrounded by nature and many of the plants, animal and birds he was familiar with made their way into his poems and songs.

Although much of Burns work is generally associated with Ayrshire and lowland Scotland, as well as his romantic encounters, his songs and poetry contain Highland and Island references too. One of his best-known pieces is the song 'My Heart's in the Highlands':

*'My heart's in the Highlands'*  
 My heart's in the Highlands, my heart is not here  
 My heart's in the Highlands a-chasing the deer,  
 A-chasing the wild deer and following the roe  
 My heart's in the Highlands, wherever I go!

*Farewell to the Highlands, farewell to the North  
 The birthplace of valour, the country of worth!  
 Wherever I wander, wherever I rove  
 The hills of the Highlands for ever I love*

*Farewell to the mountains high cover'd with snow  
 Farewell to the straths and green valleys below  
 Farewell to the forests and wild-hanging woods  
 Farewell to the torrents and loud-pouring floods!*





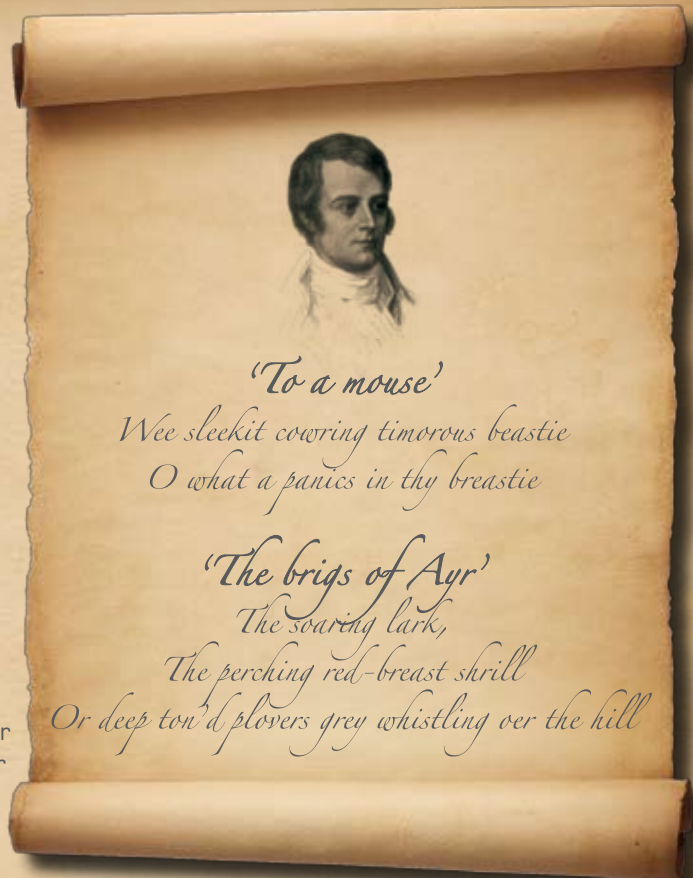


Stefano Fiorini

Like many other works, this song drew on Burn's first hand experience of the places and people he saw. In late June 1787, Burns went on the first of two tours to the Highlands, travelling around the West Highlands and the west coast. In August of that year, Burns again left Ayrshire, and this time details of his trip was recorded in Burns' 'Highland Journal'. Among the places visited by Burns were Gordon Castle, eight miles east of Elgin, Castle Grant north of Grantown-on-Spey and Kilravock Castle, six miles south of Nairn. It was during these and other tours around Scotland that Burns collected old songs and drew inspiration for his poetry. The repression of the Scottish people following the Jacobite Rebellion meant that the old songs were forbidden to be sung and were dying out. Burns collected these old fragments from people that he met and these were published, with music, by Johnson's Scots Musical Museum. My Heart's in the Highlands is attributed to Burns in 1789/90, then living at Ellisland Farm.

As Burns was growing up in the late 18th century, the Highlands of Scotland were very distant to the lowlands, in geography and politics. The splendour of the Highlands with their ancient forests, foaming streams and heather clad mountains were far removed from countryside he grew up in. It was perhaps during his farming days that Burns concluded that mankind is part of nature, not its master. Although neither Burns nor his mouse would have known what an 'ecosystem' was, both were 'truly sorry Man's dominion / Had broken Nature's social union'.

Other work eludes to man's position in nature and this could have sparked his desire to experience the people, culture and above all the wildness of nature beyond the farms and pastures he had worked in the lowlands.



*'To a mouse'*

*Wee sleekit cowering timorous beastie  
O what a panics in thy breastie*

*'The brigs of Ayr'*

*The soaring lark,  
The perching red-breast shrill  
Or deep ton'd plovers grey whistling o'er the hill*



Wikipedia

Burns died in Dumfries on 21st July 1796 aged 37.



**MURDER MYSTERY & MICROSCOPES**  
 UNEARTHING THE SCIENCE  
 BEHIND CRIME FICTION

City Links



David Riley

Crime fiction came face to face with science fact last September as some of the UK's top crime authors and a group of real-life Crime Scene Investigators put fictional forensics under the microscope.

The Macaulay Land Use Research Institute delved into the science behind fictional crime, when it presented the 'Murder, Mystery and Microscopes' event at the University of Liverpool as part of the annual BA Festival of Science, sponsored by the Wellcome Trust.

Three of the biggest names in crime fiction - Val McDermid, Peter James and Margaret Murphy - read extracts from their novels, whilst four of the country's top forensic experts, including Lorna Dawson from the Macaulay Land Use Research Institute, revealed the science behind the stories. Amongst the many science areas covered were computer hacking, arson, post-mortems, geoforensics, anthropology and DNA analysis.

The event also saw the first demonstration of the computerised SoilFit GIS tool which combines street

maps with detailed information on soil and vegetation to help the police narrow down areas of search, or even to check alibis, perhaps from traces of soil found on suspects' shoes - a system that has been developed by the Macaulay Land Use Research Institute scientists with their collaborators, and supported by the Engineering and Physical Sciences Research Council.

Author Margaret Murphy said: "These type of events are a unique opportunity to hear what the scientists think of the way in which science is presented in fiction. True-crime buffs, crime fiction readers, aspiring writers - anyone who has even a passing interest in crime - were fascinated by the insights provided by the experts."

The event closed with a book signing by the authors, and an opportunity for the audience to question both authors and scientists about their work.



Barrie Milne



## Macaulay Scientist provides evidence to House of Lords

Macaulay Land Use Research Institute soil scientist Willie Towers acted as the technical expert to David Barnes of the Scottish Government at a House of Lords inquiry into the EU Less Favoured Area (LFA) scheme. Willie briefed David Barnes on the issue and the implications before the session as well as answering questions during the inquiry.

The EU proposes to delimit LFAs on the basis of a standard set of common biophysical criteria to identify areas with natural handicaps. The criteria include climate, soil and topography and, by testing these suggested criteria, the Institute has found that some do not adequately represent Scottish conditions. Willie outlined these concerns to the Environment and Agriculture Committee and how these criteria were being actively debated with the JRC, the research support arm of the European Commission.

This is the first time that a scientist from the Macaulay Land Use Research Institute has been invited to provide technical evidence to the House of Lords. Lord Livsey of Talgarth commented that *"It is a privilege to have somebody from the Macaulay Institute here today"*, an indication of the esteem in which the Institute's research is held.

## Macaulay Scientists win Journal award



Congratulations to Dr Katrina Brown, Dr Rachel Dillely and Dr Keith Marshall who have won the Sociological Research Online SAGE Prize 2009 for their paper, 'Using a head-mounted video camera to understand social worlds and experiences' published in Sociological Research Online, Volume 13, Issue 6.

This prize is awarded to the paper judged to be the most innovative and/or exceptional in the past year's volume of each of the BSA's four prestigious journals: Sociological Research Online, Sociology, Work, Employment and Society, Cultural Sociology, and was accepted by Rachel at the British Sociological Association Annual Conference in April.

## Student Seminar Day

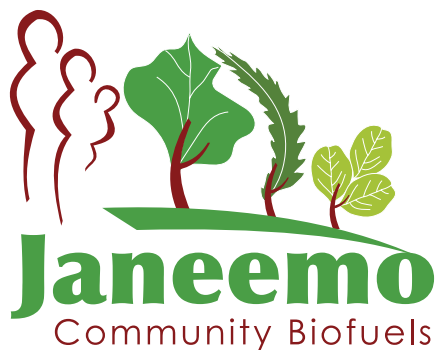
Congratulations to Kerry Waylen who gave the best presentation at the annual Student Seminar Day outlining her project, 'Conservation and Local Culture: Determinants of Success in Community-based Conservation Projects'.

Chris Hall and Christian Imholt were awarded joint second place with Liz Bourne and Loic Nazariez rated Highly Commended.

Kerry will be going forward to represent the Institute at the Science for Life Student Festival on 20 and 21 May in Dundee hosted by the Scottish Crop Research Institute.

See also 'Seven Weeks Near Tibet' on pages 18 and 19 of In-Land Autumn 2007 for more details of Kerry's research project.





## Food, Fuel and Fertiliser

Providing villagers in Malawi with the resources to grow and process bio-fuels for household and village needs is the focus of a new Climate Futures project. JANEEMO is an innovative 3-year project to develop a sustainable biofuels programme in the Lower Shire district of Chikwawa in Southern Malawi.

Three tree species, Jatropha, Neem and Moringa - collectively known as JANEEMO - are being grown by farmers on land not suitable for food crops and as living fences around households and fields, helping to protect soils from wind and soil erosion and livestock damage.

The trees all have multiple uses: their oil-rich seeds can be processed to produce oil for cooking and lighting, or turned into soap; the residue from this process can then be used to produce biogas for cooking; and then finally as an agricultural fertiliser. In addition, extracts from the Neem and Moringa trees have important nutritional as well as medicinal uses. Moringa leaves have more Vitamin C than oranges; more Iron than spinach and more Vitamin A than carrots and Neem is considered an effective insect repellent.

### Project aims

A recent analysis by the Malawi government identified over 75% of households in Chikwawa District as extremely poor. HIV/AIDS has led to a reduced labour force, nutrition



Charlie Henderson

levels are poor and access to health and education services are limited. Households are often female headed with women and girls facing the multiple challenges of caring, and supplying food and energy, for growing households. Communities are heavily dependant on shrinking forests for firewood but sourcing firewood is becoming increasingly difficult, reducing time available for education and enterprise development.

The JANEEMO project reduces livelihood vulnerability, builds thriving enterprises and delivers income generation, food security and renewable energy. The approach is delivered at the household level and encourages wider enterprise and trade beyond the village helping to build local skills, knowledge and natural resources.

Project co-ordinator Grant Davidson explains how the project works: "A seed pass-on scheme will ensure the programme stimulates enterprise and develops its own momentum. To start, 30 farmers will be trained - who will each pass on their know-how and seedlings to ten others. By the end of year three, over 2000 farmers will be involved - growing 10,000 JANEEMO trees and producing 2500 litres of biofuel - a total of 5 million litres of biofuel - annually."

"Priority will be given to meeting household and village fuel needs, such as oil for lamps and generators," he

added. "Hand oil presses, used by individuals for biofuel processing, will be distributed widely. Once household needs are met, construction of village-scale processing plants will allow enterprise to flourish. Over time, each district will establish an 'energy centre', including a diesel engine, oil expeller, generator and maize mill - which will be managed by a JANEEMO growers association".

A film is currently being developed which will be shown to farmers in Malawi to explain the project, as well as used to educate school children in Scotland about the project and its aims.

### Partners

The project is being led by the Macaulay Land Use Research Institute, and is supported in Scotland by Climate Futures, a multidisciplinary carbon management and climate communication agency.

In Malawi, Entech is responsible for implementing the main project activities, ensuring appropriate training and advice are given. The JANEEMO project will also be working in close collaboration with the Department of Forestry within the Government of Malawi, along with many community and village groups.

For more information contact  
Grant Davidson  
g.davidson@macaulay.ac.uk  
or visit  
www.janeemo.org

# 2009



The Murder, Mystery & Microscopes event (see page 18) was part of a successful series of events organised by the Macaulay Land Use Research Institute over the past year.



## 2009 Spring Seminar Programme

The well received 2009 Spring Seminar Programme saw a wide range of invited speakers cover a variety of topics from the 'Ecology and Conservation of Bumblebees' by Professor David Goulson from Stirling University to the 'Evolution of stream ecosystems in recently deglaciated terrain in coastal Alaska' by Professor Alexander Milner from the University of Birmingham.



In February 2009, the Macaulay Land Use Research Institute also hosted the first annual ACES seminar in conjunction with the University of Aberdeen.

## Forthcoming events

### Wednesday 20 – Thursday 21 May 2009

All Energy 09, Aberdeen  
[www.all-energy.co.uk](http://www.all-energy.co.uk)

### Friday 29 – Saturday 30 May 2009

Gardening Scotland, Edinburgh  
[www.gardeningscotland.com](http://www.gardeningscotland.com)

### Friday 5 June 2009

Murder, Mystery & Microscopes: Unearthing the science behind crime fiction  
[www.macaulay.ac.uk/news/MurderMysteryMicroscopes09.php](http://www.macaulay.ac.uk/news/MurderMysteryMicroscopes09.php)

**SOLD OUT**

### Friday 5 June 2009

Macaulay Lecture - "Living on a Shrinking Planet: Challenges and Opportunities for Sustaining Global Land Use"  
[www.macaulay.ac.uk/MacaulayLecture/2009](http://www.macaulay.ac.uk/MacaulayLecture/2009)

### Saturday 6 June 2009

Open Doors event  
[www.macaulay.ac.uk/OpenDoors2009](http://www.macaulay.ac.uk/OpenDoors2009)

### Thursday 25 – Sunday 28 June 2009

Royal Highland Show, Edinburgh  
[www.royalhighlandshow.org](http://www.royalhighlandshow.org)

### Saturday 5 – Thursday 10 September 2009

British Science Festival, Guildford  
[www.britishtscienceassociation.org/web/BritishScienceFestival/](http://www.britishtscienceassociation.org/web/BritishScienceFestival/)



# Free event for all the family



On Saturday 6th June, The Macaulay Institute opens its doors to you. In addition to a tour of our research facilities, our family fun day will include insect trails around the grounds, self-guided tours through the arboretum, face painting and storytelling. Make sure you look out for the tanks containing alien species...

## Free Soil Testing

If you bring a sample of your garden soil, our soil scientists will tell you its pH. The soil pH indicates how acid, alkali or neutral your soil is and can influence which plants are best suited for your garden.

The guided tour of the research facilities will include:

## Health and Environment

Find out about how the environment affects our health, from the minerals in the soil, to how our surroundings can just make us feel better



## Analysing our Environment

See what happens in a busy research laboratory and how samples are analysed



## Future Climate: Future Environment

Find out about climate change and what research we are doing to prepare for what the future may bring



## National Soil Archive

Where you can marvel at Scotland's soil sample collection, maps and meet dirt doctor Dr O.R.Ganic and his soil patient Sandy



## Future Landscapes

The Virtual Landscape Theatre, plus aerial photos of Aberdeen, a computerised game for planning land use, and experiences of mountain biking recorded by headcam



## Biodiversity Nature's Network

Fun games and lively exhibits will show how the way we live affects the plants and animals around us.



**Doors open at 10.30am**

**Last guided tour of the facilities at 4pm**

Disabled access available. Free parking.  
Enquiries to [opendoors2009@macaulay.ac.uk](mailto:opendoors2009@macaulay.ac.uk)



[macaulay.ac.uk/OpenDoors2009/](http://macaulay.ac.uk/OpenDoors2009/)

The following videos have been commissioned by the Macaulay Land Use Research Institute to provide an educational resource to stimulate debate on climate change, explain the complex relationships between us and our precious water resource, and outline how our Virtual Landscape Theatre helps people to explore landscapes of the past, present and future.



### Choosing our Tomorrows

This film explores what life could be like in 2050 through the video diaries of the same Scottish farming family as they experience three very different futures...



Callisto Productions



### Water Under Pressure

From mountain top to sea, and hydrology to human behaviour, understanding the bigger picture is the best way to stop putting our 'Water Under Pressure'.



Callisto Productions



### Virtual Landscape Theatre (VLT)

Watch 'Putting People in the Planning Picture...' and step into the landscapes of tomorrow.



Callisto Productions

Videos are available to download from [www.macaulay.ac.uk/videos](http://www.macaulay.ac.uk/videos)

For a free DVD copy, please e-mail [enquiries@macaulay.ac.uk](mailto:enquiries@macaulay.ac.uk)