

Action packed summer in the Flows

Another summer has come and gone, and like migrating birds, a flock of scientists, volunteers and students took temporary residence in the Flows to sample, measure, monitor... and occasionally bask in the sunshine! This is our update on some of the activities that took place between June and September. Many thanks to all the contributors!

Project updates

The Flows part of a global project on microbial communities

In July and August 2014, Rebekka Artz (JHI), Catherine Smart (JHI) and Roxane Andersen (ERI) collected peat samples in Forsinard (Cross Lochs, Talaheel, Lonieliest and Dyke) and in Munsary for a Joint Genome Initiative's Community Sequencing Program entitled '*Fungal, bacterial, and archaeal communities mediating C cycling and trace gas flux in peatland ecosystems subject to climate change*', led by Prof. Erik Lilleskov (Michigan Tech University). The two sites, along with Auchencorth Moss and Flanders Moss (still to be sampled by JHI) have been included in a collaborative network of >60 study sites and scientists covering broad latitudinal and climatic gradients and natural hydrologic/pH gradients. Extensive microbial community profiling will be carried out by ribosomal amplicon-based high throughput sequencing on cores where plant community data, peat chemistry and porewater chemistry (DOC, phenolics, organic acids), WT depth and peat temperature will also be analysed. The objective of the study is to determine the links between short-term environmental variables (e.g., water table depth, current temperature, instantaneous gas flux), longer term environmental variables (climate, pH, plant community, peat C:N, cumulative CO₂ and CH₄ fluxes) and peatland microbial community structure. *Roxane Andersen (ERI) & Rebekka Artz (JHI)*



Roxane Andersen (ERI) & Rebekka Artz (JHI)

Causes of decline in the common scoter in the Flow country inferred from paleoecology



Hannah Robson and a team of fieldworkers from University College London, Natural History Museum and The Wildfowl & Wetlands Trust were in the Flows for 19 days of fieldwork in August/September. This work is part of Hannah's PhD research using palaeolimnology to examine the decline of Common Scoter breeding in the Flow Country. Aquatic macrophyte surveys were carried at 18 lochs and short cores were also taken from two of the lochs which the team were unable to visit on their previous coring trip last October. The macrophyte surveys of these remote

lochs were carried out by boat, with between 40 and 80 points being visited per loch depending on loch size. At each point macrophyte species, abundance and structure were recorded as well as information on water depth and sediment type. The aim was to understand the contemporary differences between current and historic Scoter breeding lochs and to develop our understanding of how the lochs may have recently changed when compared to macro-fossil remains from the cores.

Hannah would like to thank all the landowners for their permission to survey and also the following people for all their help in field: Carl Sayer (UCL), Steve Brooks (NHM), Andy Bamford (WWT), Claire Lofthouse (WWT), Thomas Ayshford (NHM), Sacha Dench (WWT), Viv Jones (UCL), Nigel Cameron (UCL), Jono Reeves (WWT) and Geoff Hilton (WWT).

Hannah Robson, UCL.



Update from the RSPB Forest-to-Bog Team at Forsinard

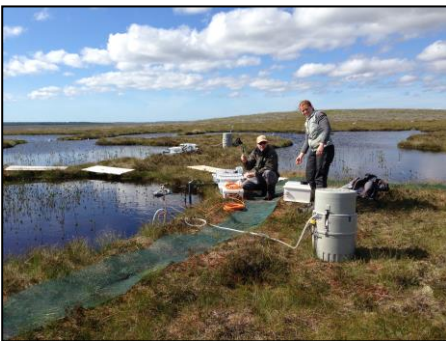
Work on the Forest-to-Bog Restoration Project is still going well. Vegetation transects undertaken from July-September have now been completed and all dipwells have been marked up so that they can be re-found once felling has finished. Tenders were received and considered in August, and felling and restoration work is now imminent. To prepare for this we've not only been marking up dipwells but also plot boundaries with different coloured tape according to the various felling techniques. The monthly dipwell rounds will continue as normal throughout the autumn and winter months.

Sadly, my time at Forsinard as the Forest-to-Bog Restoration Project Intern has come to an end. It was fantastic to work with so many different people and to observe such a variety of research being carried out on the reserve, in particular having a tour of one of the flux towers, measuring gas fluxes from pool systems and extracting gas from chamber traps. I'd like to say a big thank you to all the people who took the time to take me out and show me their research, and for letting me get involved. I plan to continue my peat bog experience by undertaking a Masters by Research at the University of Leeds with Andy Baird (one of the researchers I spent a day with during my time here) as my supervisor, carrying out research on self-restoring peatlands in North Wales. I'll be sad to leave Forsinard but I'm sure I'll be back in the future to see how the felling has gone and maybe to help re-find all those dipwells I've spent the summer getting to know! *Rachel Sneddon (RSPB)*.

NERC Pools Project update

Regular monitoring and sample collection has been underway for over a year now at the Forsinard Reserve for the NERC-funded Peatland Pools Project, a collaboration between the Universities of Leeds and Stirling, and CEH Edinburgh. We're studying the hydrology, water chemistry, and greenhouse gas (GHG) flux at natural and artificial peatland pools to help us understand the role pools play in the peatland carbon cycle. In addition to the regular data collection, there's been several other trips north this year to collect data and samples for experimental work, such as radiocarbon analysis of various carbon products in the pool waters and examining the effects of pool proximity on peat thermal conductivity.

At the end of June, we carried out a week of intensive fieldwork, including a full 24 hour sampling round to capture diurnal GHG flux. The site was temporarily inundated with automated instruments to collect water samples and measure a number of chemical and physical parameters within two of the larger natural pools. We also used an 'ultraportable' (in reality about 20kg!) greenhouse gas analyser to measure CO₂ and CH₄ fluxes from several positions on the water surface and adjacent peat every two hours. We got a fantastic dataset (if not much sleep) from this work, and next year we'll repeat the work at the artificial pools. *Ed Turner (University of Leeds)*



Left to right: Andy Baird (Leeds) and Rebecca McKenzie (ERI) setting up for the 24h campaign, Ed Turner (Leeds) sampling dissolved GHG at 02:00, Measuring GHG flux from the peat surface at 04:00

Innovative Forestry Removal at Strathy North Wind Farm

Strathy North wind farm is currently under construction and comprises of 33 x 2.05 MW wind turbines. The consent includes a commitment to remove the existing non-native commercial forestry for 675ha. This removal is a challenge due to the scale and ground conditions present, but SSE have used their experience from other forested wind farm sites to take the lead in this area for innovative tree removal techniques, to enable long term land management at the site.

One of the ways this has been enabled is by developing a whole tree harvesting system based on low ground pressure equipment. This allows the complete removal of the tree crop, with no stumps above ground level, whilst also spreading the load of the machinery, to minimise ground damage. This is key in the longer-term management of the forestry.



Removal of all conifer material where harvested, also requires the brush (lop and top) material to be removed and typically there are constraints to such materials becoming a usable end market product. At Strathy North the material is to be mixed with chipped round wood stems also taken from site so that a useable end product to market



is produced. Carrying out works in this way requires considerable investment and innovation by our contractors, which in turn is supported by SSE, demonstrating our committed approach to sustainable development.

Nicki Small, SSE

SSE is planning to hold a presentation on this in more detail in the coming months, for which details will be advertised on in the local area. For more information on the project visit www.sse.com/strathynorth.

Other news and announcements

Mapping the Flow Country Research Hub

We are currently developing a Google [map](#) of the Flow Country Research Hub, highlighting key academic and non-academic partners, as well as sites where research projects are ongoing. Our aspiration is to compile and add a short project list (title, years and funding source) and links to websites/pages on the map, so that the map can be used by anyone in the network to keep track of the various research activities and opportunities. If you are leading a research project in the Flow Country or your details are missing from the map, we would like to hear about it! Please send us the relevant details by [email](#) and we will add them to the map. In addition, you can now find information about the Flow Country Research Hub on the [ERI's website](#), along with pdfs of all the previous editions of the newsletter (available for download). *Roxane Andersen (ERI)*.

Peatland Action: Learning from Success – Annual IUCN Conference, 20th-22nd of October 2014, Eden Court (Inverness)

The focus this year will be on peatland management including restoration techniques and will present some of the latest research findings on the benefits of peatland restoration. During the conference, a series of short workshops (30 min) will be held where a panel of experts will be taking questions from attendees about key issues around peatland restoration in the UK. The session will focus on 1) exploring what long-term research studies are needed to answer fundamental questions and 2) how and where can funding for such research come from, and what resources are available. We have created a shared google document ([here](#)), and we invite you to visit the page and contribute to the list ahead of the conference. Whether you will attend or not, we welcome your opinion to identify key issues that should be discussed. *Rea Cris (IUCN UK)*.

Valuing peatland ecosystem services for sustainable management

Prof. Mark Reed (Birmingham City University) and collaborators recently published a special section in the journal *Ecosystem Services* that explores how issues of uncertainty may be incorporated in decision-making for the natural environment. The section covers the entire chain from methods of quantifying ecosystem services over their valuation to the development of policy tools, using peatlands as a case study. Most of the information will be relevant for the upcoming restoration and monitoring in the Flow Country. For details, visit the [EScom](#) blog or contact Professor Mark Reed (Email: Mark.Reed@bcu.ac.uk)

Job opportunities

Flows to the Future: now hiring

Following the successful bid to HLF, the Peatland Partnership and the Flow to the Future project are now advertising for three peatland-related posts in the Highlands and Islands. Applications are invited for one community development officer, one advisory officer and one learning officer. The closing date for the applications is the 6th of October, and the interviews will be held at the end of October. More details on each post and on the application process are available on the RSPB website under [Job Vacancies](#).



Photo by: Rebekka Artz (JHI)

The next edition of the newsletter will come out in December, please email your contributions to Roxane Andersen (roxane.andersen@uhi.ac.uk) before the Friday 7th of December 2014.