



BRISC

BIOLOGICAL RECORDING IN SCOTLAND

Scottish Charity No. SC024418

Issue No 92 January 2014

ISSN 0966-1964

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Earthworms constitute the largest biomass of all soil fauna. They are referred to as ecosystem engineers due to their ability to alter soil structure, either directly by forming burrows or indirectly, for example, by enhancing soil nutrients through cast production. Earthworms are considered a positive addition to soil as burrows provide aeration and drainage; earthworm mucus can be a dietary substrate for bacteria that ultimately provide nutrients to plants; some earthworm species - but not all - take freshly-shed and/or decomposing plant material from the soil surface into the soil for conversion by other soil fauna (e.g. protozoa, nematodes, bacteria) into nutrients that are subsequently taken up by plants. Earthworms are frequently used as "bio-remediators" of contaminated soil. They are typically added to soils that have toxic levels of heavy metals and arsenic compounds, which are taken up by earthworm tissue and thus removed from soil in an environmentally friendly manner.



Figure 1. The **endogeic** (see p.3) earthworm species *Octolasion cyaneum* with a characteristic blue-grey pigmentation. © Roy Neilson



Figure 2. The **anecic** (see p.3) earthworm species *Lumbricus terrestris*, possibly for most people the most quintessential earthworm species visible on lawns after heavy rain and "pulled" from soil by birds. © Roy Neilson

EARTHWORMS: OUR ECOSYSTEM ENGINEERS – a surprisingly under-recorded taxa

By Roy Neilson & Brian Boag

From a young age we are all familiar with the sight of earthworms in our gardens or being a tasty morsel for a voracious bird. Similarly in 1837, observations of earthworms by Charles Darwin led him to present a paper entitled the *Formation of Mould* at the Geological Society of London. Twenty-two years after publishing his seminal work *On the Origin of Species by Means of Natural Selection*, Charles Darwin considered earthworms such key organisms in soil that he published in 1881 *The Formation of Vegetable Mould through the Action of Worms, with Observations on their Habits*. Thus the foundation highlighting the importance of earthworms in soils was laid.

However, not everyone considers earthworms to be a positive addition to soil, ask the greenkeeper at the local golf course or bowling green, as earthworm casts are considered a blot on the green landscape. Additionally, it has been shown that earthworms can on occasions be secondary hosts to animal parasites and vectors of plant pathogens by moving soil from one location to another.

Continued p.3



Chair's column

I am writing this a couple of days before Christmas and the winter storms are in full force. Is this a time for biological recording? Well maybe not when the wind is howling but the calm winter days are spectacular and a beach walk can be very rewarding after the stormy weather, because you never know what can be washed up. One project up in Highland, that is going very well, is the Highland Seashore Project, see <http://www.highlandbiodiversity.com/seashore.asp>. Hundreds of people have been involved with it and we still have another 18 months to go. This sort of project is something that can be replicated all round Scotland's varied coast.

I was down in Dumfries-shire in November for work and it reminded me how much wildlife there is down that part of the world: the Barnacle Geese at Mersehead were amazing and there was even a leucistic "Barnie" that definitely was not a Snow Goose. I was running a course for aspiring Wildlife Guides, and one of the drills was to find something on a guided walk to talk about. One stop was at Turkey Tail Fungus *Trametes versicolor*, a variegated bracket fungus I had previously overlooked, and another was *Xanthoria parietina* the Golden Shield Lichen. The detail that the students managed to find out about these commonly seen species shamed me, a so called naturalist. There were amazing stories to be told about these species.

Turkey Tail, so called because it looks like the tail of a wild Turkey, has a product derived from it that has been shown to have anti-cancer properties; it is also an annual. Incidentally the wild Turkey was Benjamin Franklin's choice for the United States' national bird.

Golden Shield Lichen is commonly seen at the seashore, with the bright yellow/ orange seen just above the splash zone. It likes this habitat and also farm buildings, as they are rich in nitrogen. Knowing this, makes sense of where you see it. Its Latin name means the yellow one on walls.

This showed me that you should not get complacent and just accept that you do not know about things, but you should investigate and maintain your curiosity. One other thing I did on this course was to eat a haw, the berry of the Hawthorn. Birds eat them; they are not poisonous, so why not give them a go? It was like a cross between an Avocado and an apple, not unpleasant, but you have to mind the pip. I will now look at Hawthorns with new understanding.

You will note that there is, unusually, not much railing against a lack of action for biological data at the national level. Since it is the season of goodwill, I thought I would give that a rest. I attended one of the high level Scottish Biodiversity Strategy meetings a few weeks ago and did manage to make the biological data point there. I have a suspicion that the SBS may actually deliver this time, probably not as much as many want but more than has been done in the past. Possibly all this goodwill has gone to my head...

I hope that you all had an enjoyable Christmas and a fun Hogmanay. I am looking forward to both with a clear conscience as I have submitted my biological records for this year... have you?

Jonathan Willet



Editorial

How much do any of us know about earthworms? Not nearly enough, is my guess, so here is your chance to learn more about this very important group of recyclers, or as Roy Neilson calls them, 'eco-system engineers', without which we should be knee-deep in debris. It is also rather shocking to see how few dots there are on the map of Scotland for earthworms (p.3). It would be good if together BRISC could generate a lot more records for Roy and his team. There are images on <http://www.nhm.ac.uk/nature-online/life/other-invertebrates/earthworm-slideshow/> but what we really need is an app!

In contrast to the very beneficial earthworms, the second main article in this issue is about destroyers, or at least potential destroyers: it is not just ash diebacks that our current tree landscape is threatened with, there seem to be a very uncomfortably large number of other destructive and invasive pathogens on the march, described by expert Prof Stephen Woodward. As Steve indicates, this rise in invasive pests and pathogens is mainly due to the global trade in billions of live plants that has become part of globalisation. Revisions in legislation at the UK and European levels may help to reduce the probability of incursions, but will it be too late?

Lower case or capitals? How should vernacular names of species be spelt? In personal notes I expect everyone uses capitals - I certainly do - but the editorial rule for 'Recorder News' has long been to use lower case, the argument being that, in order to be consistent, lower case is preferable because otherwise casual mentioning in the text of odd species such a rabbits or beech trees would also have to be spelt with capitals. Now, in the moth recording group, of which I am a member, there has recently been an animated discussion about the likely confusion arising from names, which include words such 'small'. Take a species like the quaker - a small quaker could be a small individual of the 'quaker' moth, or a 'small quaker' which is a different species altogether, and there are many similar instances. If you know the group under discussion, it may be easy enough to tell the difference, but occasionally it can cause real problems, such as when I was working for Fife Council and supplied photos for a poster of butterflies that the general public were to look out for. One species was the small pearl-bordered fritillary, which ended up as - you have guessed it - the pearl-bordered fritillary, not recorded for Fife and thus highly misleading, and I found myself manually adding the word 'small' on every poster. The moth e-group was firmly for using capitals, and as the editor of this newsletter I have now decided to change the rule, so that from now on, all proper species, including the odd Rabbit or Beech will be spelt with capitals. What do readers think?

Anne-Marie Smout

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Continued from page 1

Being intimately associated with soil it is unsurprising that earthworms are considered to be influenced by soil moisture, pH (see later) and temperature. Earthworms are vulnerable to desiccation and will not survive prolonged drying of soils (<20% soil moisture content), and it is common during summer to find earthworms undergoing the process of aestivation, curled up in a tight ball trying to protect themselves from dry soil conditions. Equally, earthworms are aerobic, thus requiring oxygen to survive, and consequently are unable to survive prolonged water-logging. Earthworms differ in sensitivity to acidity depending on species, with litter-dwelling species tending to be more acid tolerant. Many species have a temperature optimum in the region of 12-20°C, typical of UK soils for many months each year.

Changes in the soil environment, particularly in an agricultural setting, can have a profound impact on earthworms. Modern tillage practices with, for example, more and deeper ploughshares per plough-turn over increasingly larger volumes of soil and to a greater depth. Also, in general, farm machinery is increasing in size and weight, leading to soil compaction. Combined these effects can have a negative impact on earthworms. Changes in cropping practice, where plant residue is now quickly removed after harvest, decreases the availability of a seasonal food-supply prior to the autumn/winter period, compounding the effects of modern machinery.

Within the UK, earthworms are a diverse taxa in terms of pigmentation, including species that are green, grey, iridescent blue (see Fig. 1 on page 1); pink and the more common red-brown (Fig. 2 on page 1). Furthermore, earthworms can be classified into three feeding-distinct groups which are spatially separated in the soil profile: **Epigeic**: live in and consume litter, they are usually small individuals and uniformly pigmented (Fig. 3); **Endogeic**: live in horizontal burrows in mineral soil horizons and geophagous (humus feeding), being small and large species, weakly pigmented; and **Anecic**: live in deep vertical burrows connecting surface and mineral horizons, being mostly large species, brown/red pigmentation.



Figure 3. The epigeic earthworm species, *Dendrodrilus rubidus*, a typically small surface dwelling species with pinkish pigmentation.

Given the importance of earthworms, it is perplexing that such an important taxa is so under-recorded compared to, for example, woodlice (Fig. 4). It is estimated that for every one record of the most common UK earthworm species,

Aporrectodea caliginosa, there are 42 records of *Oniscus aselus*, one of the most common woodlice species in the UK.



Figure 4. The stark comparison of the biological recording of (left) all UK earthworms and (right) *Oniscus aselus*, a common UK woodlouse.

In Scotland, very little is known regarding the distribution of earthworms. Until the 1990s the only published records of Scottish earthworms were from trips to the Western Isles in 1938 and 1957 as well as three local studies conducted in 1910, 1951 and 1952. In the mid-1990s, the first ever national survey of earthworms in agricultural land across Scotland was undertaken. A stratified random selection of 100 farms derived from the agricultural census was made. At each farm two fields were selected for sampling, with one arable field and one pasture field (Fig. 5) where possible, selected with the permission of the landowner. In each field we sampled five replicate quadrats. Back in the lab, earthworms were counted, identified to species and biomass weighed.

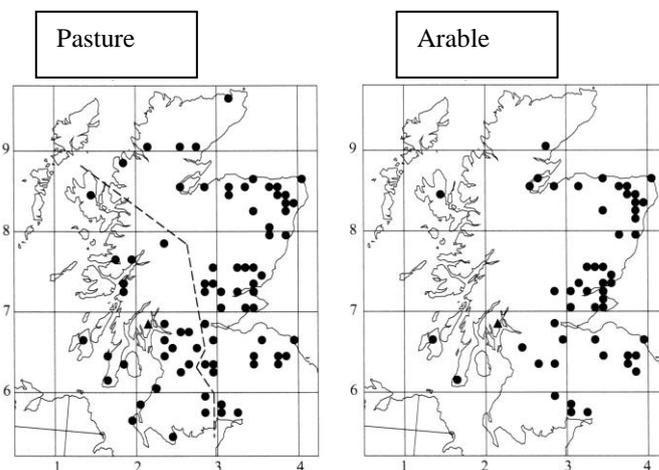


Figure 5. The first national survey of earthworms in agricultural land across Scotland. Dots represent the location of sampling sites.

Thirteen earthworm species (Table 1 see next page) were recorded with one species, *Lumbricus friendi*, new to Scotland, and these contribute to the total of 27 species now recorded for the UK. Contrary to perceived wisdom, the first national survey found that soil pH and soil texture (% sand, % silt and % clay) had no influence on any of the recorded earthworm species. All except two of the thirteen recorded species were distributed across Scotland, with *Aporrectodea nocturna* and *Lumbricus festinus* not being recorded from farms in northern Scotland. Furthermore, the horizontal distribution of earthworms in both arable and pasture fields was similarly aggregated for adult and juvenile earthworms. Recently the

same 100 farms (200 fields) have been re-sampled to ascertain whether changes in earthworm diversity and abundance have occurred over a period of fifteen years. Currently the data is still being collated. In a separate laboratory study, providing six commonly occurring earthworm species in Scotland with a choice of food, seven plant species and soil, revealed that, with the exception of Creeping Buttercup (*Ranunculus repens*) and White Clover (*Trifolium repens*), all food sources were equally selected by the studied earthworm species and confirmed their generalist feeding behaviour.

Earthworm species	Arable	Pasture
<i>Allolobophora chlorotica</i> (pigmented and unpigmented)	Yes	Yes
<i>Aporrectodea caliginosa</i>	Yes	Yes
<i>A. nocturna</i>	Yes	Yes
<i>A. longa</i>	Yes	Yes
<i>A. rosea</i>	Yes	Yes
<i>Dendrodriilus rubidus</i>	Yes	Yes
<i>Lumbricus castaneus</i>	Yes	Yes
<i>L. festivus</i>	Yes	Yes
<i>L. friendi</i>	Yes	Yes
<i>L. rubellus</i>	Yes	Yes
<i>L. terrestris</i>	Yes	Yes
<i>Octolasion cyaneum</i>	Yes	Yes
<i>Satchellius mammalis</i>	No	Yes

Table 1. Earthworm species recorded during the first national random stratified survey of agricultural land in Scotland. Presence or absence of a recorded earthworm species in arable or pasture fields is noted.

Our native earthworm is under threat by the presence in Scotland of a predatory invasive flatworm, *Arthurdendyus triangulata* (Fig. 6), commonly known as the New Zealand flatworm. Since the first record of *A. triangulata* in Scotland during the 1960s at the Royal Botanic Garden Edinburgh this is now widely distributed across Scotland (Fig. 7) mostly in domestic gardens, likely dispersed as eggs which resemble small blackcurrants (Fig. 6) that can contain up to ten larvae. To our knowledge the flatworm has no preference for a particular earthworm species and, when present, appears to predate on all earthworms. On occasions, earthworms have been reduced to below detectable levels with the flatworm surviving by re-absorbing some of their tissue whilst waiting for earthworms to recover in number. Currently there is no recommended method of control or disposing of *A. triangulata*, thus it remains a threat to one of our iconic soil taxa.



Figure 6. An adult *Arthurdendyus triangulata* (with an egg), a non-native flatworm species known to predate on native earthworms.

With such a prevalent threat to one of our key indigenous taxa it is surprising that no earthworm species is included in local biological action plans. These ecosystem engineers are important to underpinning the environmental infrastructure that soil provides. However the under-recorded status of earthworms with, for example, no known data on earthworm diversity and distribution from (semi-)natural or woodland habitats in Scotland, is a serious knowledge gap. Until this paucity of data is addressed there are only a handful of Scottish habitats that can act as a baseline comparator for environmental change.

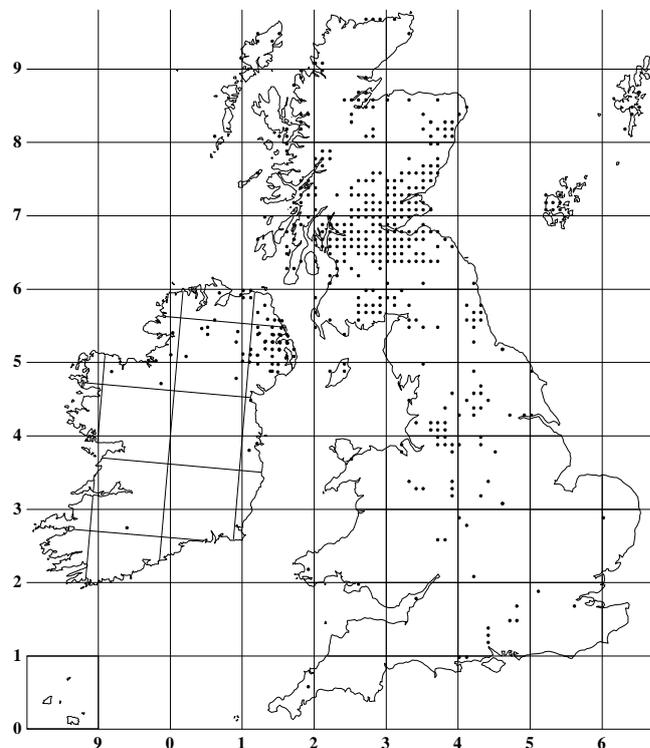


Figure 7. Distribution of *Arthurdendyus triangulata* within the UK.

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WHAT IS HAPPENING TO SCOTLAND'S TREES?

by Steve Woodward, University of Aberdeen.

The discovery of ash dieback caused by *Hymenoscyphus pseudoalbidus* in Ash woodlands of eastern England in October 2012 caused shock-waves in various circles: forest owners, the Forestry Commission, woodland charities, conservation organisations, as far as the Department of Environment, Food and Rural Affairs at the heart of UK Government and, from this, the devolved administrations. The outbreak became such a hot topic, that the UK Government called a COBR meeting to instigate a response.

The problem in the East Anglian Ash woodlands had obviously been present for over two years: it was difficult to determine precisely how long the Ash had been suffering, as signs of infection in dead twigs are quickly covered by further decay.



Some Ash foliage killed by the ash dieback pathogen.
© Steve Woodward

The pathogen was well established; it was not going to be eradicated. We had to rescue what we could from a bad situation. Several mature Ash woodlands in Scotland are known to be affected: it is simply a matter of time before all are. Imagine Rassal Woodland in northwest Scotland depleted of Ash trees – the loss in biodiversity is unthinkable. Yet it will happen in time.



An Ash tree killed by *Hymenoscyphus pseudoalbidus* (ash dieback) in Sweden. © Steve Woodward

Many newspapers made the arrival in the UK of Dutch elm disease in the mid-1960s the baseline for reporting. But *Ophiostoma novo-ulmi*, the pathogen causing that problem, was not the first invasive disease to hit UK trees. Two *Phytophthora* probably arrived in the UK in the early to mid-1800s; the most common form of oak mildew arrived from North America in the late 19th Century; a less virulent form of Dutch elm disease affected elms from approximately 1918, although by the 1950s it was considered insignificant. The bacterial pathogen *Erwinia amylovora* arrived in the south-east of the UK in the early 1950s and spread rapidly, causing fireblight on rosaceous trees and shrubs.



Tan Oak killed by *Phytophthora ramorum* (taken just north of San Francisco). © Steve Woodward

But certainly since the mid-1980s, we have witnessed an unprecedented increase in the numbers of invasive pests and pathogen arriving in Europe, including the UK, causing massive problems in forests and ornamental woody plantings.

Trees in Scotland are not exempt from these alien invasions. Ash dieback is recorded at sites in Midlothian, Fife and Moray. Dutch elm disease is highly active throughout northern Scotland where each year, more Wych Elms succumb to infection.



Serious *Lophodermella* damage on young Scots Pine at Culbin.
© Steve Woodward

Scots Pine, the National Tree of Scotland, is attacked by an array of pathogens, mostly long-known. It is however, suffering from one highly damaging invasive pathogen and is threatened by numerous others already present in Europe. Numerous needle pathogens attack Scots Pine, many probably native, competing for dominance in the foliage. *Lophodermium seditiosum* can defoliate young trees, but has seldom proved

problematic in forests. *Lophodermella* species can render plantations somewhat ragged after suitable conditions for pathogen development. Several other pathogens may erupt on needles, given suitable conditions for development.

The most damaging agent now impacting on pines throughout much of the northern hemisphere, however, is Dothistroma needle blight (DNB), caused by *Dothistroma septosporum*, which has surged in importance over the last 15 – 20 years. First recorded in the UK at a nursery in southern England in 1955, it was only considered a problem in Southern Hemisphere pine plantations. Scots Pine was thought of low susceptibility to DNB until recently, when it was attacked, sometimes leading to severe defoliation and occasionally death. In Scotland, it is probable that inoculum build-up from the heavily infected Lodgepole Pine planted over such wide areas, led to breakdown of Scots Pine defences against *D. septosporum*. The pathogen requires very high humidity for infection, conditions which are common in Scotland. Sadly, the disease is known to be present in several remnant Caledonian pine areas, leading to great concern over the future health of these stands.



Gartly Moor – the brown trees are all Lodgepole Pine killed by *Dothistroma* needle blight © Forestry Commission Scotland

Pine wood nematode, *Bursaphelenchus xylophilus*, native to North America, is killing pines in Portugal, and has been reported in Spain. Although in the relatively cool conditions of Scotland it is unlikely to kill pines here, presence of the nematode in timber would prevent trade.



Fusarium circinatum dieback of *Pinus gregyii* in South Africa. © Steve Woodward

Pine pitch canker, resulting from *Fusarium circinatum* infection, however, currently a major problem on plantation *radiata* pines and native Shore Pines in north western Spain, is

a serious threat to Scots Pine. Probably originating in the mountain pine forests of Mexico, *F. circinatum* spread widely and, along with Spain, is present in North America, South Africa, USA, Haiti, South Africa, Japan, Korea, Chile and Uruguay. Elsewhere in Europe brown spot of pines, caused by *Mycosphaerella dearnesii*, is causing serious defoliation on pine species, including Scots Pine. A combination of these disease problems present a very serious threat to the iconic native Scots Pine and should be taken very seriously by the authorities.

A word that is dreaded by ecologists, conservationists and foresters is ‘Phytophthora’. Etymologically, it is good to be scared of the word: it translates from its Greek derivation as ‘plant destroyer’, and that is what many species in the genus do. Well-known for *Phytophthora infestans*, cause of potato blight, more species are found each year. Since about 1990, over 30 newly recognised species have been formally described, most of which attack trees. *Phytophthora ramorum* is well-known, having been transported in hardy ornamental nursery stock through much of Europe. Oceanic conditions in the west of the UK and Ireland are conducive to development of this fungus-like organism where, until 2008/9, it was considered a major problem on rhododendron, from which it would spread to and kill other Ericaceae and Fagaceae. In 2009, however, it was found causing mortality in Japanese Larch plantations and, where the inoculum load was high, in Douglas Fir and European Larch. A few Sitka Spruce trees were killed, when growing amongst Japanese Larch. A second invasive Phytophthora species, *P. lateralis*, was discovered in 2010 killing Lawson Cypress in a park on Loch Lomond, but has now been confirmed throughout the UK. Although mainly damaging to exotic trees, it is causing problems in parks, gardens and arboreta.



Larch death: a patch of Japanese Larch killed by *Phytophthora ramorum* on the west coast of Scotland. © Forestry Commission Scotland

Of greater concern in a conservation sense, is the finding of *Phytophthora austrocedrae* in our rare native Juniper heaths. The only other place we know of this pathogen is in Patagonia, where forests of Southern Cedar are being decimated: it is clearly not native in that region either. We have no idea where the organism arose. Northern British Juniper heaths were being regenerated, a process involving taking Juniper seed from the heaths, and raising native plants in nurseries. It is highly likely that *P. austrocedrae* was taken to the heaths on contaminated roots of these nursery-grown plants. Since its first discovery in 2012, the disease has spread widely in Scotland, threatening the existence of juniper heaths.



*Juniper killed by Phytophthora austrocedrae –
© Billy Bodles of Highland Birchwoods.*

Climate change is probably exacerbating these effects. But the main cause of this rise in invasive pests and pathogens is trade in billions of live plants, along with plant products, that has become part of globalisation. Revisions in legislation at the UK and European levels may help to reduce the probability of incursions. Although global trade, particularly in plants between continents, may be immediately responsible for this upsurge in invasions, in reality, we all carry responsibility for what is happening : we create the demand for the imports; importers then fulfill those demands in the most cost-effective way they can find.

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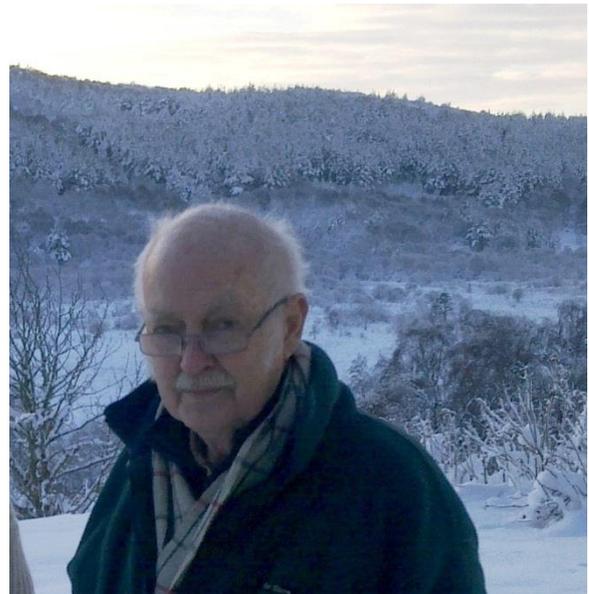
Mobilising the records of the late Philip Entwistle

By Stephen Moran

Philip Entwistle (1931-2012) carried out field research in the Highlands, for the Institute of Invertebrate Virology, Oxford (National Environment Research Council) during the 1980s and settled in retirement at Spinningdale, southeast Sutherland, from about 1990 onwards. Until 2009 he was actively collecting and recording insects, in particular, true flies, bees and sawflies and the causers of plant galls, from Spinningdale Bog, Migdale Wood, Ledmore Wood and the land around his home at Rivra. There are many records from further afield in Sutherland and a lesser number from other parts of the Highlands.

The vast majority of Philip's data remain 'locked up' in these collections (circa 12,000 specimens from Sutherland), a short-lived card index (approx 600 cards, 8-900 records), a daily entomological journal kept from 1993-2006 (approx 500 pages containing a wide range of observations) and correspondence *BRISC Recorder News* No 92

relating to Highland Biological Recording Group (HBRG) species recording schemes in which he was closely involved.



Philip at Rivra, Christmas Eve, 2010. © Stephen Moran

A brief survey of the collection shows that Philip's sheer industry has unearthed many interesting records of species beyond their previously known range, some extremely rarely recorded in this area, and at least one species new to science, *Platygaster entwistlei* Buhl, 1997 (a parasite of juniper gall causers). Although records of some of the hoverflies were supplied to the Hoverfly Recording Scheme (Philip was the national scheme organiser for several years in the 1980s), the vast majority of the spatial and temporal data contained in the collections remained untapped and unavailable to HBRG and NBN datasets. Initially, I estimated there to be records of between 1200-1500 species in all.

It was Philip's wish that these collections go, in due course, to the National Museum of Scotland in Edinburgh. Although they will be preserved and accessible there - at a distance - it was thought by some that the time-consuming extraction of data might be carried out before they go to Edinburgh. In this way, the data would be available to NBN and researchers whilst it is still relatively current.



Hoverflies Criorhina ranunculi in the collection © Stephen Moran

Members of the HBRG Committee, BRISC and the Rogart Wildlife Group supported the idea of funding this work and were successful in securing generous grants from Scottish

Natural Heritage and the John Spedan Lewis Foundation. In the last year, Nicole Dunn (Card Index), Murdo Macdonald (Aculeate Hymenoptera and data transfer), Hayley Wiswell (Hoverflies) and Stephen Moran (Remaining Hymenoptera, Diptera and other orders) have extracted information from various elements of the collections.

So far, just over half way through the source materials, nearly 4,500 records have emerged of around 1400 species.

The significance of the data is best summarised by comparing a sample of the records generated to the existing maps on the NBN Gateway. The samples included were taken from the Coleoptera (Genus: Aphodius – dung beetles), Hymenoptera (Symphyta – Sawflies) and a range of Diptera (true flies). From a sample of 307 species, 12% were found to have no previous Scottish records on the NBN Gateway (as it currently stands; the existence of patchiness in coverage is recognised by the author). 85% of the species in the sample were new to Sutherland (vcs 107 and 108). Northward extension (not necessarily expansion) of known range for some of the species was also measured with 14% extended by 100km, 16% by 50km and 20% by 25km. These figures look promising, however, a more rigorous testing of the information will have to await the completion of the project.

Stephen Moran
November 2013
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REPORT ON PROJECTS

BURSARIES:

Want to study wildlife?

The 2014 application form is now available for downloading at <http://www.brisc.org.uk/Bursaries.php> or <http://www.gnhs.org.uk/bursaries.html>

This year, thanks to the generosity of Glasgow Natural History Society and an anonymous donor, we have 7 bursaries on offer of up to £200 on any professional development course on taxonomy run by the Field Studies Council, at Kindrogan or elsewhere, or similar professional courses run by universities or others. The criteria are as follows:

- Bursaries are open to anyone living in Scotland.
- Courses should be run by FSC www.field-studies-council.org or similar professional development courses run by universities etc.
- Courses should be completed before 31 October 2014.
- Applications for courses on plants, invertebrates and other animals where there is a shortage of taxonomic expertise will be particularly welcome.
- Indicate in the box below how you plan to use your newly acquired skills.
- The successful candidates are required to write a short article (300-400 words) on their course experience for *BRISC Recorder News* and/or the *GNHS Newsletter*. £15 of each bursary will be held back until receipt of the relevant article.

All applications should be submitted to bursary@brisc.org.uk by 31 January 2014

(Kindrogan courses are listed at the end of this newsletter)

Herewith the last report from the 2013 bursary recipients:

Sphagnum Moss course at Kindrogan

By Claire Foot

Conservation and natural history are both my passion and my occupation. I work as an Assistant Warden for the Royal Society for the Protection of Birds (RSPB) up in the Flow Country, in Caithness and Sutherland. This is the world's largest expanse of blanket bog and therefore a prime location for sphagnum spotting and study.

I have always had a passion for natural history; however, my academic background is not in ecology or botany. The vegetation ID skills that I had prior to 2013 were mainly learnt through previous roles on varying habitats or developed through personal study. I was therefore overjoyed when I was successful in gaining one of the BRISC and GNHS bursaries for improving my natural history skills.



A carpet of sphagnum © Claire Foot

I chose to use my bursary to fund the sphagnum moss ID course that was run by FSC at Kindrogan. Sphagnum covers large areas of the peat up here in the flow country in a fantastic multi-coloured, multi-textured carpet all year round. So this opportunity to learn more about the individual species, their characteristics and the varying habitats that they occupy was too good to pass up.



Fellow course attendees ID in the field © Claire Foot

The course did not disappoint. We visited a variety of habitats in highland Perthshire, a band of enthusiasts, led by a knowledgeable and approachable expert Nick Hodgetts. The evenings gave us a chance to build on our developing field ID

skills, by undertaking microscopy work, enabling us to view these amazing plants in even greater detail.

My role as Assistant Warden, sees me line-managing a group of residential and local volunteers. Many of them are pursuing a career in conservation, others are looking to try something different or are on a working holiday. Since attending the sphagnum moss course at Kindrogan, I am able to share more knowledge and information about the bog and its plants with the volunteers, helping to build on their enthusiasm and interest.

I also help with public events on the reserve, such as our 4x4 safaris, which enable the public to see more and gain a greater understanding of peatlands and the Flow Country. The course has enabled me to expand the knowledge that I have to share with them.

Finally, the course has been great as it has enabled me to identify specific elements of the environment that I am walking across, while walking in my free time or working on the reserve. I will, in the future, be undertaking vegetation surveys on the peatland, where this course and the information and knowledge it provided will be invaluable.

Thank you .



The Perthshire Hills © Claire Foot

Update from the Scottish Biodiversity Information Forum (SBIF)

By Christine Johnston

In the last edition of *Recorder News* I gave details of the SBIF Action Plan. These details, and other information about the actions, are now posted on our web pages, and I would encourage you to look them up (follow the link to our home page which is given at the end of this article).

The web pages have been developed as a central point for information about the Forum and its activities. Please also take a look at our Data community pages, linked to from the side panel on the home page, where you will find articles written about how biodiversity data is used within different sectors of the Forum. Work is in-hand to expand the content of these pages to include all sectors of the data community; we would also like to expand our Resources web page and would be interested to hear of any useful additions you might have for that page.

The Forum has now started working on the delivery of the SBIF Action Plan. At the SBIF Data Flow & Data Sharing sub-group meeting on 1 October the delivery of Actions 2, 6

and 7 was discussed in detail. We have initiated work on all three Actions, and details can be found in the Our Work sections of the web pages. It is hoped that Action 6, the compilation of four short case studies involving biodiversity data, will be completed by the end of March 2014.

I enjoyed the 2013 BRISC Conference last October. I learnt a lot about recording apps and took the opportunity to try out the Record Wildlife app. on my phone. I found it easy to use, but discovered for myself two limitations of smart phone technology: one, that recording in woodland can obscure clear sight to the multiple satellites required to get a good GPS position, so it is good to cross-check grid references against a map, and two, that I should carry a spare battery, as my phone ran out of power rather quickly. Well, it was all part of the learning process!

If you would like to get involved with the Forum, or to be kept informed of SBIF's activities through our mailing list, please get in contact:

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Twitter: SB_Info_Forum

BRISC ANNUAL CONFERENCE AND AGM ON SATURDAY 26 OCTOBER 2013

By Sarah Eno

The magnificent buildings and wonderful grounds of Newbattle Abbey College near Dalkeith were the location for the Annual Conference and AGM meeting in October. And the theme was "New Technology for Biological Recording" with presentations on smart phone applications (apps) and also the end-use of data.

The morning was taken up by indoor talks and a chance to look around at the large number of different displays and the 'market place' offering personal contacts and advice regarding the various technologies. Neil Gregor, the developer of the 'Record Wildlife' app. started with an excellent beginners' introduction as he ran us through the screens of this app. It can be used as a notebook, since all and any species can be logged, along with location (up to 10fig. grid ref.), the recorder's name (becomes automatically loaded, once entered) and date. For biological records the accuracy is very important but this can be a big problem when the phone cannot read the global position systems (GPS) satellites – such as under tree canopy. We confirmed this in the afternoon: as Neil said, you need to be in open space for GPS to work. There seemed to be no pre-loaded dictionary, so the species' name has to be typed in full each time. A couple of questions revealed that GPS is very battery hungry and may mean charging a phone twice a day. You can now get covers to waterproof a smart phone.

We had an amazing overview from Stephen Moran of the work involved in systematising and electronically recording the copious paper records and thousands of invertebrate specimens collected by Philip F. Entwistle. Read Steve's resumé of his talk on page 7 in this issue.

If you are recording one particular taxon, such as amphibians, then ‘**Dragon Finder**’, which was described by James Stead, is more appropriate. This app has been developed by **Froglife** to help people identify and learn about amphibian and reptile species and report on a sighting. It has large on-screen buttons and simple questions to lead people through the menus. The species photos are good, and pages of information are very clear. The app can be found via the Froglife website. Species sightings sent in to Froglife are sent on for verification by experts and then, after about six months, the records are passed to local record centres.

There are an increasing number of on-line interactive resources for citizen science projects. Anthony McCluskey of **Bumble Bee Conservation Trust** (BBCT) described BBCT’s ‘**Bee Walk**’, a transect project. This can help anyone interested to set up their own transect and also improve their ID skills. In spring 2014 the report on the first three years of the project should be published. He also spoke about ‘**Bee Watch**’, run from Aberdeen University, which is a project to investigate the best use of on-line resources for recording wildlife. You can take a photo, send it to ‘Bee Watch’, who will get an expert to verify any identification and subsequently contact you by email. There is a learning element built into this as well – see <http://homepages.abdn.ac.uk/wpn003/beewatch/index.php?r=site/page&view=about> for more information.

A new Bumblebee field guide app was also mentioned, which is another great resource to help with ID, this is for I-phone or I-pad only (i.e. not for *all* smart phones). The app is based on the ID book *Bumblebees of Britain and Ireland* published by Nature Guides. This can be found through <http://bumblebeeconservation.org/about-bees> or directly at <http://www.birdguides.com/webzine/article.asp?a=3814> where there is the download link, some useful information and user reviews.

Graham French, NBN’s Technical Liaison Officer, then spoke about **iRecord** and new developments of the **NBN Gateway**. There are now 90 million records available on the Gateway and about 10 million are added annually. iRecord, which can be accessed from any computer connected to the Internet (or smart phone), is a “website for managing and sharing your records...with the recording community”. Before you can use iRecord, you have to register (for free) with username and password, after which you get access to more information and a training tutorial consisting of series of videos, where you can practice entering records before doing it in earnest. All submitted records are verified by a pool of about 140 experts. All records added to iRecord go straight into a database hosted by the Biological Records Centre known as the *community warehouse*, because it is shared by a number of other on-line recording databases. All non-sensitive records added to iRecord are immediately available for browsing on the Explore pages of the website. All verified records from iRecord are shared via the NBN Gateway in datasets administered by the relevant recording scheme, local records centre or survey organiser. From there, the records are made available to a number of other websites via NBN web services, and to an international audience via GBIF. Also mentioned was using **Instant Indicia** to build your own recording website – see <http://www.indicia.org.uk>

Christine Tansey of the Woodland Trust then talked about **Nature’s Calendar**, which is a website organised by the trust aimed at collecting long-term for an impressive list seasonal events datasets (phenology) relating to different wildlife groups, not just trees. She also spoke about The Woodland

Trust’s **Ancient Tree Recording Scheme**, which works closely with the Ancient Tree Forum and the Ancient Tree Register. Rather than being apps, these schemes are website based. Christine, however, also spoke about the **Track a Tree app**, which is being developed, to be launched in 2014, where you can record understory species of a tree throughout the year.

Site Condition Monitoring (SCM) is the method by which protected sites are checked against a set of condition targets for specific species, habitat or geological feature. Zoe Russell from Scottish Natural Heritage spoke of a developing SCM programme (SWIFT) for the Android Nexus tablet for use in the field, so data is recorded directly. It will include photographs to which the site results can be attached and can be sent quickly to the site owners and occupiers as well as stored readily in SNH systems. The application can be used off-line and is therefore not limited by web access issues when working outside. The information collected by this method is however not in a form which can automatically go to a Recorder database and thus to NBN or records centres.

The conference gave a good introduction to the range of devices and apps, and there seems to be an increasing plethora of these for nature observations. Most apps appear to depend on internet (on-line) access, which can be poor or non-existent in many areas, especially in Scotland. It should be possible to design apps, which access many facilities such as ID resources or dictionaries, so they do not need continuous internet connection. But there is obviously plenty of fun to be had as well, as some very good tools are now available and, for sure, plenty more will be coming along.

After the AGM and lunch we then were divided up into different groups with a view of exploring the extensive and quite delightful grounds.

Many thanks to the conference organisers, to the TWIC staff for assisting and for the wonderful location.

Minutes of BRISC’s Annual General Meeting on Saturday 26 October 2013 at Newbattle Abbey College 12.40-13.00

Apologies: Richard Sutcliffe

Present: Brian Boag, Gordon Corbet, Liam Templeton, Anne-Marie Smout, Chris Smout, Sarah Eno, Lindsay Bamforth, Mike Beard, Adrian Sumner, Barbara Sumner, Patrick Milne-Home, Richard Weddle, Louisa Maddison, Jonathan Willet, Graeme Wilson, Natalie Harmsworth, Steve Hannah, Christine Johnston, Jackie Stewart, Mark Pollitt, David Lampard, Glenn Roberts, Duncan Davidson, Kenneth Watt, Ro Scott, Keith Bland, Jim Thompson.

The minutes of the 2012 AGM were accepted without changes or comments.

Proposed: Anne-Marie Smout; Seconded: Graeme Wilson

Chairman’s report (the full report - previously circulated - is available for downloading at <http://www.brisc.org.uk/conferences/2012%20ANNUAL%20REPORT.pdf>)

- We have seven bursaries for 2014, with BRISC offering two, Glasgow Natural History Society generously increasing their bursaries to four, and BRISC’s anonymous donor once again providing a donation of £200 to the project. We hope for even more bursaries in the future to be sponsored by organisations such as SEPA.

- The data-scoping project will be tendered by the end of the financial year.
- Highland Biological Recording Group have returned the money given to them for the production of their *Mammal Atlas*

Membership and Finances:

- We have 102 individual members, 32 corporate members.
- Finances remain healthy in spite of the poor level of subscription payments due to continuing problems with sorting out new standing orders following the bank having blocked our account.
- Subscriptions would be low again this year but hopefully things would be resolved soon.

The accounts were accepted, proposed by Chris Smout; seconded by Louisa Maddison.

Committee members:

- Gill Dowse and Claire Seymour have stepped down from the committee – thanks to them for all their input over the past few years.
- Sarah Eno (newsletter co-editor) has joined the committee.
- Election of all members was proposed by Mike Beard; seconded by the entire meeting.

There was no other business and the meeting closed at 13.00
Louisa Maddison, BRISC Secretary

Conference picture gallery – thanks to Christine Tansey and Stephen Moran



Delegates gather at Newbattle Abbey



The very comfortable 'Market Place'



Jonathan welcomes us all



Steve Moran on Philip Entwistle's collection



Lunch and time for a chat



The chapel was opened for us



We were lucky with the weather



and the grounds were magnificent



The fungi were a great feature of the walks



The fine ancient Sweet Chestnut was admired



It took a lot of us to measure its girth



Returning to base in time for tea

NBN Gateway news

Release of NBN Gateway version 5

The new version of the NBN Gateway (v.5) gives better performance and stability due to investment in servers that can cope with the increasing volume of data (now almost 100 million records) and increased usage of the system. NBN Gateway 5 is more flexible in terms of accessing and downloading data and the interactive may now makes it possible to select and query multiple records and create maps of two or more species in different colours.

Other major changes include

- All publicly available records can be downloaded and their details are available to view on screen
- Improved download functionality. For example, data downloads are supplied in a single table rather than a separate table per dataset. It is also possible to download whole datasets
- You now need to log in to view record details on screen or download data
- It is easier to administer datasets and organisations deal with access requests and proactively grant access
- The NBN Gateway 5 runs off REST web services. Information on the REST API for developers wishing to use web services in their own systems is available on the NBN Gateway Documentation pages.

As well as logging in before requesting access to data or downloading data, users also have to state the reason for the access request or data download by selecting a use category from a dropdown list. The NBN Gateway Terms and Conditions remain the same as on the old website, which means that users need written permission from the data providers if they wish to use the data for commercial purposes. Thanks to the more detailed download logs, we know the data are being used for a wide range of useful and interesting purposes, including:

- Statutory work under the Water Framework Directive requiring records of eelgrass (*Zostera marina* and *Zostera noltei*)
- Surveys to locate potential species-rich/Annex 1 lowland grassland/wetland habitats in Scotland
- A large number of MSc and undergraduate student projects, for example a GIS project to analyse the change in distribution of Grey and Red Squirrels in the UK and re-introduction methods
- Studies of personal interest to expert amateur naturalists, including a study of aculeate Hymenoptera of sand dunes
- Conservation projects, such as habitat management work for a freshwater Local Biodiversity Action Plan

The changes to the NBN Gateway meant a major update to the system and unfortunately initial teething problems were encountered, but these are now fixed. The NBN Trust thanks all the users and data providers for their patience whilst the issues were resolved and hopes that everyone is now enjoying using an enhanced NBN Gateway. If you have any feedback or comments we would like to hear from you at access@nbn.org.uk

Did you know?

ID Resources

The NBN Trust has started to compile a list of ID Resources to help the recording community. It is bringing together photographs and ID guides from colleagues and organisations across the Network and will continue to add to this over time. If you have any resources you would like to share on this web page then please contact m.henshall@nbn.org.uk. The current list can be seen at <http://www.nbn.org.uk/Tools-Resources/Recording-Resources/ID-Resources.aspx>

NBN News

NBN Conference

This year's Conference was well attended with around 160 delegates coming together at the Royal Society on 15th November.

The theme was "Future Challenges of the NBN" and the Keynote address was given by the Shadow Environment Minister, Barry Gardiner MP, who also chairs the All-Party Parliamentary Group on Biodiversity. The Sir John Burnett memorial lecture was given by Professor Bill Sutherland and Honorary Membership was awarded to Stuart Ball who jointly runs the Hoverfly Recording Scheme. Other presentations were given by Lisa Kerslake (Swift Ecology), Richard Fox (Butterfly Conservation), Alan Law (Natural England) Steve Cham (British Dragonfly Society), Paul Wilkinson (The Wildlife Trusts), Ed Mackey (Scottish Natural Heritage), Sue Townsend & Richard Burkmar (The Field Studies Council).

The presentations, photographs and video of the day can all be found on the NBN website <http://www.nbn.org.uk/News/Latest-news/NBN-Conference-report-and-presentations.aspx>

Chief Executive

The current NBN Trust Chief Executive, Dr. Jim Munford, retires in May 2014 and recruitment is now underway to find his successor.

NBN Trust Data & Liaison Officer

Paula Lightfoot, the NBN Trust's Data Access Officer is leaving the post at the end of January to commence a PhD role at Newcastle University. The Trust is therefore recruiting for a Data & Liaison Officer.

This role will be the principal contact between volunteer recorders and the Local Record Centre (LRC) community with the Trust. Key areas of work will be to maintain the suite of data standards and tools used by the NBN and to work across the NBN to help with data provision and use issues.

Further information can be found on the NBN website under News and Job Vacancies. The closing date for applications is 16 January 2014 and interviews will take place in Nottingham w/c 3 February.

Bob George

We are sad to report that Robert "Bob" George passed away on 9 November. Bob was awarded Honorary membership of the NBN Trust at the NBN Conference on 18 November 2005. This was given to him in recognition of his services to the study of insects and biological recording, notably for his long service, since before 1960, as voluntary organiser of the UK *Siphonaptera* (Flea) Recording Scheme, and for his pioneering work in supporting the employment of standard nets for sampling insect populations.

In Practice

NBN Training for Forestry Commission Scotland

In November, the NBN Trust ran two days of training for members of Forestry Commission Scotland staff on how to use NBN tools and data to inform their operations. Scottish Natural Heritage provided a well-equipped IT training room at their premises in Battleby, enabling NBN Trust staff Geoff Johnson and Paula Lightfoot to deliver a 'hands-on' course in which participants gained practical experience of using the new NBN Gateway and iRecord. The course also covered the background to the NBN and the importance of the wider NBN partnership in improving the quality and accessibility of biodiversity data.

After the course, participants all said they felt more confident in the use of NBN tools and saw potential to increase their use of biodiversity data from other providers and to share data captured through their own operations. There are plans to add Forestry Commission estate boundaries to the NBN Gateway in the new year to facilitate the production of site reports and management plans.

CIEEM Training: Accessing and Using Biodiversity Data

The NBN Trust and ALERC ran a training workshop in December as part of the Chartered Institute of Ecology and Environmental Management (CIEEM) professional development programme. The tutors Tom Hunt (ALERC) and Paula Lightfoot (NBN) explained the data services provided by local environmental records centres and the National Biodiversity Network and demonstrated the latest technology in biodiversity data management. Using real survey reports and case studies, the workshop aimed to give participants a good understanding of best practice in ecological desk studies, the relevant legislation and the terms and conditions governing data use.

The workshop took place in Birmingham and was attended by 13 participants, including two from Scotland. This is the second year the workshop has been run, and it has been adapted this year in response to feedback from previous participants and to incorporate new developments such as the launch of NBN Gateway v5. There are plans to run a similar workshop in Scotland in 2014 in collaboration with SBIF.

Presentations from the course can be found on the Training Materials page on the NBN website.

Copy Deadline for the next issue of *BRISC Recorder News* is Saturday **15 March 2014**. All material please to the editors at anne-marie@smout.org or saraheno@riseup.net or tel. AMS at 1333 310330

BOOK REVIEWS:



Bulmer, D, Gillings, S, Caffrey, B, Swann, R, Downie, I & Fuller, R. (2013) *Bird Atlas 2007-2011: The Breeding and Wintering Birds of Britain and Ireland*. BTO Books, Thetford. ISBN Hb £69.00

This enormous book, over seven pounds in weight and 720 pages long, is as big as a large church Bible, and the comfiest place to read it must be between the wings of a brass eagle. It presents a challenge to lift, let alone to browse. The *Atlas* is so very big because it represents the work of around 40,000 volunteers examining 600,000 locations and generating 19,000,000 records over five years. The project was funded by raising £1,500,000 from charities and generous individuals. The data was analysed and turned into a book by a team of six dedicated authors and a prodigious in-house publication effort. Nothing like it has ever been seen in “citizen science” before. It is impossible not to be astounded by the achievement.

The scale of the book is also so large because 156 pages are devoted to six introductory chapters explaining the methodology (which most readers will want to flick through), and one devoted to the pattern and change of bird distribution over the last 40 years, that everyone will want to read, though not everyone will find it easy going. By contrast, the last breeding atlas had eighteen pages of introduction, and the winter atlas had 33 pages. Both these were produced by Poyser-- a good professional publisher might have proposed this time that a lot of the introductory material (and some relating to the appendices) be put on line, and perhaps that the book be published in two volumes like *The Birds of Scotland* -- unless that would have made the cost prohibitive.

This is germane, as the maps illustrating the 296 species accounts, which form the meat of the book, are more numerous but smaller, and much more difficult to read than in preceding atlases. To understand the species density accounts at county level, one often needs a magnifying glass. In the breeding distribution maps, the disparity between symbol size on the keys and on the actual map, can make it hard to see if a species is proved or merely suspected of having bred in a given locality. The choice of colour shading on the breeding abundance maps can make it hard without practice to tell at a glance if the trend has been up or down in a given square.

Every native species (and some aliens like the Ruddy Duck) are allocated a colour photo, about six inches of a single column of text commenting on status, patterns of distribution, abundance and changes over time-- and up to seven maps. Most recent aliens and relative rarities are allocated less space. No systematic attempt is made in the text to estimate total populations, though this was a feature of earlier atlases. Yet when so much of the species accounts discuss population percentage changes, one clearly needs an idea of the size of the population involved. Data from the excellent and succinct paper by Musgrove *et al.* in *British Birds* in 2013 could have provided a good basis, not least because the lead author there is head of monitoring at the BTO. For some species, usually the

less common ones, estimates are indeed made, which makes a welcome inconsistency.

Occasionally, there can be a problem of taking statistics at their face value, with inadequate comment. For instance, on page 127, Table A, one learns that the species with the second largest breeding range expansion in Britain since 1988-91 was the Icterine Warbler, with an expansion of 2,600 percent. You must wait until the species account on page 549 to learn that, in the latest atlas period, there was only a single confirmed breeding record and a single probable breeding record of Icterine Warbler, plus a small scatter of singing birds, mainly on the coast, optimistically described as possible breeders.

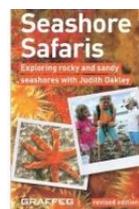
The persistent reader will nevertheless be rewarded with an extraordinary wealth of information about what is doing well and what is doing badly in our avifauna. The familiar declines of summer visitors like the Turtle Dove and the Nightingale, of breeding waders like Curlew and Redshank and of some residents like the Grey Partridge and Lesser Spotted Woodpecker, spring from the page. Others have not so much declined as moved north, like the Willow Warbler and the House Martin. The spread of the Common Buzzard and the Raven are astonishing, and the success of re-introductions, the Red Kite and the White-tailed Eagle, are self-evident. Other changes are much less known and subtle, like the spread of the Grey Wagtail in the extreme north of Scotland as well as in East Anglia and the East Midlands, or the decline of the inland-breeding Common Tern in Scotland balanced by increases in England. The Yellow Hammer has declined in most places, but lost most ground in Ireland, the western Highland fringe and the Pennines.

More complete coverage of Ireland in this atlas compared to its predecessors has emphasised some interesting differences in density. Several common breeding species, like Swallow, Starling, Blackbird, Song Thrush, Mistle Thrush, Robin and Wren are much more densely distributed in Ireland than in Britain. The Meadow Pipit is most abundant in Scotland in summer and in Ireland in winter. The Lesser Redpoll has seriously declined in summer as a breeder in the south-east of England, but increased as a wintering bird in Ireland. The Grasshopper Warbler has especially increased in Ireland and the south-west of Scotland. The Blue Tit and the Great Tit are most abundant in the south of England, and relatively scarce in Ireland and much of Scotland: the reverse is true of the Coal Tit.

In the Crested Tit entry, the maps of breeding and winter distribution do not exactly correspond to the maps of breeding and winter relative abundance. The abundance maps seem to indicate a scatter of presence some way beyond the range of the distribution maps. This is probably partly an illusion related to using different scales for the two sorts of maps, but it is certainly confusing and may actually involve a mistake.

No criticisms should obscure the fact that this is a landmark publication, and a worthy memorial to the immense effort of professionals and amateurs alike.

Chris Smout



Oakley, Judith (2011). *Seashore Safaris* (Revised Edition). Graffeg. ISBN 9781905582525. Pb £14.99

This book was recommended to me by keen marine biologist James Merryweather, who runs, amongst other things, seashore identification events. I already had the Collins Pocket Guide to

the Seashore, so did I need another book? Having a flick through James's copy I was convinced.

It passed the first test of being able to fit in a pocket, not all field guides can do this, and it was well laid out and colourful with lots of excellent photographs taken by the author. What does come across in the text and the layout is that the author is passionate about all things marine, and seashores in particular, but has produced something that those attending her seashore safaris would find useful. It is not a book with all the species you can find at the seashore and does not claim to be, but it does include quite a number and all the common ones.

After a brief introduction from the author the book starts off with a kit list, a bit of health and safety in a tidal environment and then something I really liked - "The Seashore Code"- all about animal welfare and not damaging the habitat you are exploring. Common sense but it was good to see it spelt out. Then the book goes into the zonation of the seashore.

The zones are broken down into rocky and sandy shores with the text giving an indication of what you are likely to find where. Then the next chapter identifies specific habitats on both types of shores and suggestions of what to look for. The final section talks about the strandline and what you can find there.

After this the bulk of the book looks at the animal and plant life on the beach, each species has a photograph and some information about it and identification notes. This is probably the sections that will get most thumbed when out in the field.

The final section is on conservation; it mentions the warming seas and indicators of this: non-native invasive species, beach litter and, most importantly, what you can do. One of the big things you can do is send your sightings in to the relevant organisation. These are listed on a couple of pages and it is good to know there is a Sea Slug Forum. There is a further reading list and a good glossary at the back.

I enjoyed reading this book, looking at the pictures and learning some new fascinating facts. It is a great starter book for the seashore for the young (or young at heart). Searching the strandline or guddling in rockpools is almost as rewarding as pond dipping! I wish I had had this book when I was a Seasonal Countryside Ranger at Culzean Castle leading rockpooling walks: it is a great introduction to the intertidal habitats and very easy to read. Now will someone produce a similar book for ponds?

Jonathan Willet

Braithwaite, Michael (2013). *BSBI Berwickshire County Botanical Site Register*. Privately published and available from the author – contact details on the BSBI website at <http://www.bsbi.org.uk/berwickshire.html>

I had the pleasure in December, of attending the launch of the *County Botanical Site Register (CBSR) for Berwickshire* at Harestanes, near Jedburgh. The book is the culmination and celebration (with cake) of Michael's 35 years botanising in Berwickshire.

The Berwickshire CBSR follows the similar concept as the *County Rare Plant Register* which Michael has already published. This CBSR (440 pages) is a monumental and inspiring work, providing an excellent model for others.

However, I have a confession to make first. I am a profound supporter of conservation and an amateur botanist whose

natural history knowledge is wide but sometimes sadly shallow. Thus when I started to read I had to look up the word "axiophyte". Well, we all have to learn and admitting ignorance is a valuable start!

It turns out I had been aware of the concept of assessing quality of habitats by flora without knowing there was such a useful word for it. If you already know, you can skip the next few paragraphs whilst I quote from the BSBI website:

"Axiophytes are 'worthy plants' - the 40% or so of species that arouse interest and praise from botanists when they are seen. They are indicators of habitat that is considered important for conservation, such as ancient woodlands, clear water and species-rich meadows".

"Lists of axiophytes provide a powerful technique for determining conservation priorities. Sites with many axiophytes are usually of greater importance than those with fewer; and changes in the number of axiophytes in a site over time can be used for monitoring the outcome of management practices".

For those who want to know more I commend the BSBI page and the link to the paper by Alex Lockton *et al.*

The CBSR is laid out in chapters for each of the 24 Berwickshire hectads (10km square) working from west to east. Each hectad starts with a general description of its physical characteristics and vegetation. Then within each hectad chapter, sites of conservation value are referenced by hectad and site number and described at monad level (1km square). Each of the sites has a general habitat description and comments like a "particularly fine stand of juniper.... a splendid colony of *Equisetum x litorale*.... the best example of *Blymus compressus* (has now been compromised by a duck pond)" really bring the places alive.

The site description includes the principal axiophytes, a table of Rare and Scarce species, their populations where known with a 6fig. grid reference, recorder and comment. Where lost, the evidence is supported by the historical reference, recorder and year.

Although recognising its limitations, each site is graded for quality from 1- 5 hearts: moderately good to outstanding with zero meaning that habitat is fragmentary or lost. A distribution map of the sites in Berwickshire shows the coastal strip as supporting most of the high quality sites, with clusters elsewhere inland.

Neophytes (arrived in Berwickshire after 1500) are not included generally in the site information except where they are intrusive. Useful reference tables of neophyte problems are at the back. For example, that bane of damp woodlands *Allium paradoxum* (Few Flowered Leek) which I once had cause to warn of to a seed supplier, can overwhelm the pretty *Adoxa moschatellina* (Moschatel). Michael mentions *Allium* bulbils being transported in deer hooves, judging by the lines in deer tracks as well as transport in vehicle tyres.

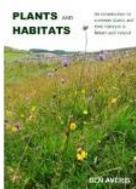
The inclusion of numerous indexes and tables of data at the back provides readily available access to botanical data such as rare and scarce species, axiophyte monad frequency (1987-2013) and extinct species. The sites surveyed are well referenced in a table, so one can easily find the right hectad chapter to discover the detail.

The book is not comprehensive because the surveys (1987-99 and 2000-2013) are based on sampling and are biased towards

the habitats of conservation concern and of likely higher botanical interest. These are therefore all the more important to conserve. But with 249 sites (which have any value) covering 9,262.8 hectares (though 'only' 7.7 % of the county) it means the Register is an extremely valuable tool for anyone who has (or should have) an interest in the conservation of an area in Berwickshire.

As MB notes that the Berwickshire flora is in "sad decline" from the all too familiar threats of inappropriate conservation actions or bad management. So this book puts into our hands an essential tool for trying to counter this trend; to add to the data set and to help landowners and their agents understand the conservation value of their areas. It should be a first stop for anyone with cause to be involved with some land management. A further check of non-mapped areas can always be carried out via a local records centre and/or the National Biodiversity Network website before making drastic changes to some "unproductive" but likely conservation interest habitat.

Sarah Eno



Averis, Ben (2013) *Plants and Habitats – An introduction to common plants and their habitats in Britain and Ireland.*

**Privately published. ISBN9780957608108
Pbk £25.00**

I was so intrigued by this book that I bought it on the strength of its advertising. I was keen to improve my plant identification and also gain a better understanding of the habitats they are found in.

The author Ben Averis is a botanical surveyor of no little experience, a bryologist and an artist. He has used all his skills and expertise in their fields to produce an excellent book. This book sets itself apart from other identification books as it seeks to be an introduction to both common plants and their habitats, giving a context to each and also indicating how the habitats we see relate to the current and historical land management of the area. I would have to say that it achieves all this rather well.

Seven hundred common and obvious species are included in the book and there are usually more than one colour photographs of the species in question, with the leaves and flowers given an equal billing. It is also written in plain English, so that those without an education in botanical description can understand what is being described. In addition coloured text highlights the main points on identification, habitats and human-related matters.

Interestingly plants are grouped by appearance, so similar looking but unrelated species are on the same page. The species are ordered into woody, grassy and other. Woody species are divided up trees and shrubs according to bud arrangement, dwarf shrubs and climbers/ scramblers. This works pretty well as it is a logical splitting of the group. Other species are split up into grasses and other grass-like plants and other plants. The latter group are divided up according to leaf shape and includes ferns, some mosses and a few lichens. I found the grouping of similar species useful but it may not be for everyone. In each section there are tables to help identification, for example flower shape in sedges.

The habitat section takes up forty pages and I really liked being able to see the various habitats and having them explained. I now know I have squelched about in lots of S9 and 10 and M3, 4 and 6 looking for dragonflies.

This book will be a very useful tool to those who are okay with plants but not experts and still get stuck on sedges, foiled by ferns and suffer bryophyte block. With excellent pictures and text explanations there is no excuse not to get better at identifying these species. The true test of the book will be using it in the field, so it will be residing inside for a few more months, but I am sure I will find it a great help. That said during the course of this review, I have found out that the mystery plant growing at the corner of my house is Tutsan, so it is already proving to be useful.

Jonathan Willet

Kindrogan Natural History Courses - 2014 programme from their website at

<http://www.field-studies-council.org/centres/kindrogan.aspx>

See also the Field Studies Council's website at <http://www.field-studies-council.org/centres.aspx> for courses at centres in England.

Course Title	Course Level	Tutor	Dates
Introduction to Mosses and Liverworts	Open for Everyone	Theo Loizou	Fri 28 March - Mon 31 March
Special Spring Moths	Open for Everyone	David Brown	Mon 07 April - Sat 12 April
Introduction to Lichens	Beginners	Rebecca Yahr	Fri 11 April - Mon 14 April
Lichen Identification	Intermediate	Rebecca Yahr	Mon 14 April - Sat 19 April
Sphagnum Moss	Intermediate	Nick Hodgetts	Tue 22 April - Sat 26 April
Scottish Spring Birds, Flowers and Butterflies	Open for Everyone	Russell Nisbet	Fri 25 April - Fri 02 May
Mosses and Liverworts	Intermediate	Nick Hodgetts	Sat 26 April - Sat 03 May
Big Tree Country: Introduction to Tree Identification	Beginners	Jerry Dicker	Fri 09 May - Sun 11 May
Big Tree Country: Tree Identification for Improvers	Intermediate	Jerry Dicker	Sun 11 May - Thu 15 May

Course Title	Course Level	Tutor	Dates
NVC: Woodlands	Intermediate	Ben Averis	Fri 16 May - Mon 19 May
Identifying Freshwater Invertebrates	Open for Everyone	Craig Macadam	Mon 19 May - Fri 23 May
Birds by Character for Improvers	Intermediate	Jeff Clarke	Wed 28 May - Sun 01 June
Evolution and Identification of Flowering Plants	Open for Everyone	Bob Callow	Fri 13 June - Fri 20 June
Flora and Fauna for Hillwalkers	Walking Level 1	Russell Nisbet	Fri 13 June - Tue 17 June
Plant Communities of Mountain and Moorland	Open for Everyone	Bob Callow	Fri 20 June - Fri 27 June
Freshwater Algae	Intermediate	Eileen Cox and Elliot Shubert	Fri 20 June - Fri 27 June
Aquatic Plants	Intermediate	Nick Stewart	Fri 20 June - Fri 27 June
Wild Orchids of Scotland	Open for Everyone	Martin Robinson	Tue 24 June - Sat 28 June
Mammal Identification	Open for Everyone	John Haddow	Fri 27 June - Sun 29 June
Spiders: An Introduction to their Identification	Beginners	Alastair Lavery	Fri 27 June - Mon 30 June
Discovering Mountain Flowers	Open for Everyone	Theo Loizou	Fri 27 June - Mon 30 June
Discovering and Identifying Wild Flowers	Beginners	Martin Robinson	Mon 30 June - Fri 04 July
Grass Identification	Intermediate	Judith Allinson	Fri 04 July - Fri 11 July
Fern Identification	Intermediate	Heather McHaffie	Fri 04 July - Mon 07 July
Introduction to NVC	Open for Everyone	Ben Averis	Fri 18 July - Mon 21 July
NVC: Grasslands	Intermediate	Ben Averis	Mon 21 July - Thu 24 July
NVC: Heathlands	Intermediate	Ben Averis	Fri 01 August - Mon 04 August
Identifying Sedges and Rushes	Intermediate	Fred Rumsey	Mon 04 August - Sat 09 August
Highland Butterflies and Moths	Open for Everyone	David Brown	Sat 16 August - Sat 23 August
Invertebrate Surveying Techniques	Intermediate	Jeff Clarke	Mon 18 August - Sat 23 August
Scottish Mammals	Open for Everyone	John Haddow	Fri 22 August - Mon 25 August
Identifying Fungi	Intermediate	Liz Holden	Fri 12 - Fri 19 September
Harvestmen Spider Identification and Ecology	Open for Everyone	Mike Davidson	Fri 26 - Mon 29 September
Small Mammals	Open for Everyone	Jeff Clarke	Fri 03 October - Tue 07 October
Autumn Birds and Migration	Open for Everyone	Russell Nisbet	Wed 08 October - Wed 15 October