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# Recorder News



## TEN YEAR'S BIRDING AROUND CRAIL: How many bird species are there in any one place?

By Will Cresswell

Imagine if you stayed in one place, anywhere on the planet. How long would it take you to see 10 bird species? Or 100? Or 1000? I have been doing this in Crail, out on the eastern edge of Scotland for the last few years. My total is up to 206, but changes every year. I hope to keep looking for birds in Crail for many years to come, perhaps another 40 years or so if I am lucky. How will my total grow? What can I expect?

Such questions are on one level just a trivial part of a desire when bird watching to keep count or keep score. To know how good an observer you are. But on another level they are a way to focus on what you have in an area and perhaps more importantly what has disappeared or never been there. Such information repeated across larger areas can help us monitor populations and identify conservation problems. And on another level still, they are a fundamental part of understanding ecological communities. If the answer to my question is, for example, 300 species after 40 years, why should this be so? Is it a local answer, or would we get a similar number wherever we went in the world? How such totals depend on location and the temporal and spatial scale you consider allow us to identify hot-spots of biodiversity on the planet and identify the conditions that promote the evolution of high levels of biodiversity. So the answer to my apparently local and unimportant questions can bring satisfaction at both a personal level as well helping us understand why we have different patterns of species richness across our planet.

Little Gulls. An East Neuk late summer speciality, although in recent years becoming a rarity © John Anderson

I started my Crail bird list when I moved here in 2002. There are three elements to my Crail list. The first two involve scale and all three involve time. My first list is my 'garden' list. Garden is in quotes because I have fudged the scale issue a bit. By garden, I mean "birds I have seen from my garden". I am lucky enough to have a sea view, although my house is set back about 200m from the shore. A telescope set up in my son's room brings it closer though. On a clear day I can identify larger birds a couple of miles out, and I imagine I could easily identify a white-tailed eagle even if it was over the May Island, some six miles away. I have managed a minke whale five miles out from my house although I acknowledge this is not a bird or even bird-sized, but it does make my point about the potential for long range identification. So it is a relatively big 'garden' allowing me a good chance to see a lot of species, and in particular those passing up and down the coast.

My garden list stands at 120 species to date. The rate of adding new species has slowed down a bit, and I am lucky if I add more than a couple every year now. It seems like a good total to me. But how does this match up to other lists? **Continued p.3**

## Chairman's column

I will have to try not to speak completely in cliché but where did the summer go? Time seems to have whizzed by from July onwards. In the Highlands we have been fortunate with the weather after the bleak June, oh, that was grim. But it has been pretty sunny up here, and we have not had the torrential downpours that the south of the country has suffered. I have been regularly updated on just how wet it has been by my parents, who live just north of Glasgow.

What impact has all this had on our wildlife and possibly our biological recording activity? There have been harbingers of doom about insect populations, though I am not sure if this has been more out of seeing an opportunity for publicity rather than a population's real perilous state arising from one bad summer. We can only be optimistic for next Spring.

I have become a keen student of daylight and, more importantly, sunshine in the last few months as I have installed solar PV panels on my roof. It has been interesting to note the sunshine patterns and also the shortening daylight hours. In Scotland our days shorten/ lengthen at between four and a half to six minutes a night, and from around 22 September, the Autumnal Equinox, Scotland gets progressively darker than points down south.

So nature is stocking up on food and shutting down, the winter migrants will not be far away, and brilliant sunrises will be visible to those not inclined for early rising. The Autumn colours are coming to the fore, and naturalists are looking at their field notebooks and thinking about getting their records in. It is also the time for conferences, and you will of course all be aware of the **BRISC Conference down in Dumfries on Saturday 27 October.** It promises to be a fascinating event and I look forward to meeting you all there.

The Scottish Biodiversity Information Forum (SBIF) saga continues and no news has been forthcoming if any progress has been made. That will be something to chat about at the forthcoming committee meeting.

Some of you may have seen the Scottish Biodiversity Strategy – 2020 Challenge consultation. It makes interesting reading, especially as it makes no mention of any of the last 16 years of biodiversity action or the years before that of plain old nature conservation. Maybe the SBS has amnesia? The best thing in the consultation is a target: a UN, an EU, and now Scottish one, "Halt the loss of biodiversity by 2020"! A big task indeed requiring a 'step-change', so says the document, in the way we do things. One would argue that the voluntary biological recording sector is doing its bit and a 'step change' is not required here. However, those responsible for disbursing public money for land management do need to, and that is arguably a bigger challenge than halting biodiversity loss.

On a cheerier note, I was out in Wester Ross last week and walked to a place called Craig in between Upper Loch Torridon and Redpoint. It has a lovely bit of birch woodland with some aspen and oak. I found a fallen oak leaf and on the underside were some galls. I have identified them as common spangle galls, created by the cynipid wasp *Neuroterus quercusbaccarum*. I await confirmation, but if my identification is correct it will be a new 10km square record. All that plus two lesser redpoll, a sea eagle and loads of fox moth caterpillars on the heather by the path.

Jonathan Willet
September 2012

## Editorial

Trees are in the news again, but not for a good reason. This time it is the ash trees. A fungus *Chalara fraxinea* is causing ash dieback on a devastating scale in continental Europe, so that e.g. 90% of the Netherlands' ash trees have died within just seven years. Norman Starks of the Woodland Trust, deeply concerned about a possible repeat of what happened to elm trees and the huge impact on our countryside, is now calling for a complete ban on all imports of ash trees. His argument is that the UK being an island, we might just stop it's arrival. Let us hope the ban is imposed and that we can 'keep the door shut'.

On a happier note, we are now looking forward to our annual conference on 27 October. It is an honourable tradition that BRISC have always moved the event around Scotland, and this time we are very excited about meeting up in Dumfries. It is sincerely hoped that many members will take the opportunity to visit this wildlife-rich part of Scotland, which is very often where any new species are first recorded for the Scottish list. We are extremely grateful to Mark Pollitt, of Dumfries and Galloway Environmental Resource Centre (DGERC), for organizing the venue and speakers for the conference.

As has also become a tradition, the afternoon is given over to outdoor excursions, and Mark has arranged three fine options for delegates to choose from. In order to help delegates decide on which excursion to go for, Mark has provided some more detailed description of the different localities than could be fitted into the programme/booking form. Here they are:

**Kirkconnell Flow NNR**
5 miles south of Dumfries, Kirkconnell Flow is the second largest raised bog in southern Scotland. The site supports plants such as cranberry and bog rosemary, a colony of large heath butterflies and a healthy reptile population. The site has undergone major restoration work in the last decade to remove trees which were widely regenerating on the bog.
Access: on tracks/paths, damp in places.

**Lochwood Oaks SSSI**
A small stand of ancient sessile oaks (*Quercus petraea*) lies close to Lochwood Tower, 15 miles N of Dumfries. These trees are the surviving remnants of a long-established oak forest dating back many centuries, and include a valuable population of veteran trees which supports an important range of wildlife and lichens. During the 1970s, the trees at Lochwood played an important role in the development of dendrochronology: the study of annual rings to date wooden artefacts and past events. Conveniently located off the A701 for anyone returning north.
Access: from the roadside, no surfaced tracks

**Caerlaverock WWT**
Caerlaverock Wetland Centre is a spectacular 1,400 acre wild reserve situated on the north Solway coast. The centre is famous for its vast flocks of over-wintering water-birds, including up to 40,000 barnacle geese from arctic Svalbard and large numbers of pink-footed geese and whooper swans.
Access: Good surfaced tracks, suitable for wheelchairs.

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Well, in a year of birding around Crail – my second list, within a radius of 10km from my house – I might hope to see 150 species, and the best day's single total for species that I have had in Crail is about 75. Even if you go to the best place in Britain for a day's bird watching – we could argue about this but let us say somewhere in Suffolk, like the RSPB's large and diverse reserve at Minsmere – you would have to work hard to get 100 species in a day. In a year's twitching (obsessive listing at the expense of family, finance and global warming) in the UK, where you did little else but go from bird to bird, you might get 360 species.

Jay. A real 'Crail' rarity. The author has only seen one (at Cambo) in ten years © John Anderson

If you are a global twitcher, and there are some very wealthy listers who do this, you might hope to see several thousand species, although even the best places for birding on the planet only yield about 300 species easily. Take somewhere like Mindo in Ecuador – an area of mega-diverse cloud forest on the Pacific slope of the Andes. The species list for the Mindo area is probably around 600 species, and it really does not get much better than that except in a few places in the Peruvian lowland, Amazon and Columbia. I chose Mindo because it is a more open area than the lowland higher diversity areas in Peru so, although it might have slightly fewer species, they are much easier to see in places like Mindo. A daily walk around a lowland rain forest may only get you sight of 35 species plus another 70 or so by call. Most of the species at any one time will just not be where you are because they occur at low diversity, and when they are, they are located out of sight in the top of a 50 meter tree above you or hiding behind a leaf. It is like birding in Crail in the fog – you know the birds are there but you have to be very lucky to see them. A day at Mindo – if you are really good on your visual and sound identification and use a little bit of playback of calls to lure some species in – could get you over 200 species. In a week maybe 400. But after that it would be slow going. You will have already seen the commoner species and now it is pure chance when you will encounter and see the rest. In my 33 years of birding in various parts of the planet I have rarely found that you can get more than 200 species in any area with any degree of efficiency. In other words to see lots of species the most efficient thing is to stay in one place for only a few days, then go somewhere else. Move to a different habitat or altitude, or the same habitat a few hundred miles away in the tropics, and a few thousand miles away in temperate areas. Scale is crucial.

So how is my Crail garden list doing – 120 species in about 10 years versus about 600 in the best areas of the planet in the same time. So not so bad. My 'garden' is clearly not a biodiversity hotspot, but then again that is 20% of the species richness from the best area on the planet and 1.2% of all the world's bird species (about 10,000).

Sanderling. An arctic breeder passing through Crail on its way to the coasts of central Africa © John Anderson

My final list is my overall Crail list. This is everything I have seen within 10km of Crail at any time. The scale represents how far I might typically walk or cycle in a day's birding. Purists might argue that this is stretching the definition of Crail a bit because it encompasses Pittenweem, Boarhills and even the May Island, but this is my list. And to be honest, ever since a pair of dotterel turned up this spring at almost exactly 10km from my house – and these were the first for over 30 years – I am not inclined to make my local patch smaller. If something really rare turns up at 10.2km I might fudge it again. I am a professional ornithologist in my day job and such bending of the rules are not allowed in science, but birding is also my hobby and so I feel free to make up the rules for my personal Crail list. My overall 'Crail' list currently stands at 208 and it is still growing although at a much slower rate than at first. As with any list, at first everything is new, but after a while you have seen most common things and then it is only the slow accumulation of rarely seen species that increases the total. The pattern for my Crail list is pretty universal for any list of cumulative species with effort (Figure 1).

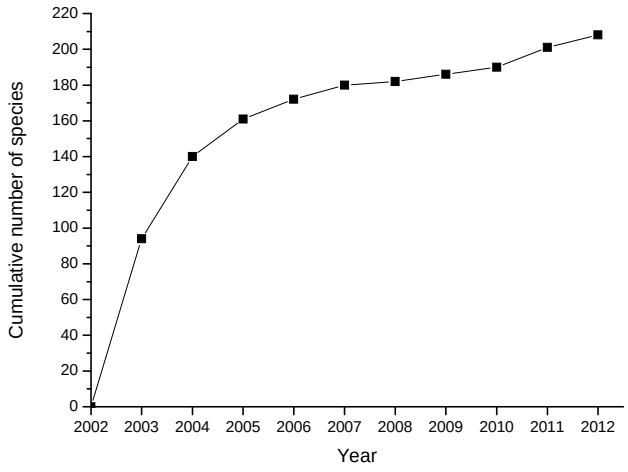


Figure 1: The cumulative number of new bird species I have seen since moving to Crail ten years ago. They may be slowing down but the total is still going up by four or five a year.

Gannet. A very common bird for Crail, only becoming rare in December and January © John Anderson

I have already dealt with how a list of 208 might stack up locally or globally – it is pretty good. I have had some fairly good species so far – mega rarities like Britain's first masked shrike from the Eastern Mediterranean (found by Tom Glass at Kilrenny and attracting a mega twitch – but that is another story), rarities from Iberia like a Sardinian warbler, uncommon migrants from Siberia like yellow-browed warblers, scarce migrants like barred warblers from Sweden and, of course, the common place like wrens and blackbirds that you might find anywhere at any time in Europe. The seabirds are great too. I have had a Sabine's gull from perhaps Arctic Canada, Balearic shearwaters from Majorca, sooty shearwaters from the southern Atlantic and of course the Arctic terns that breed in the Forth and that shuttle down to Antarctica and back in the meantime. Each year brings a few more species. The rate is perhaps slowing down a bit, and sooner or later I will start hitting the ceiling of about 300 species for any place in the temperate zone. But what the next 50 to 100 or so species will be I cannot say for sure. I can expect to get some minor local rarities like kingfisher or hobby, or expanding species such as little egrets and nuthatches, but for rarities, the overall British list is about 600 so I could take my pick for anything out of 400 species. And of course I might even add to the overall British list, like Tom Glass did, by finding a new bird for Britain in Crail. I had better get back out birding.

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See also Wild Crail at
http://www.aboutcrail.co.uk/wildcrail.html

Copy deadline for the next issue of Recorder News is **Friday 21 December.** All material, preferably in electronic format, to Hanne-marie@smout.orgH or by post to Anne-Marie Smout, Chesterhill – upper flat, Shore Road, Anstruther, KY10 3DZ

## Standing Orders

Members will remember what Duncan Davidson, our treasurer, wrote in the last issue of Recorder News (p.10) about the Bank maddingly and irrationally cancelling all Standing Orders payable to BRISC. For those members who pay the annual sub by standing order, have you filled in the form yet, which Duncan Davidson has recently posted out, and returned it to Duncan? If not, please make it a priority to do so as soon as possible. If you have mislaid the form, Duncan will be happy to send you another one. Just get in touch (contact details on p.2)

# THE ISLAND OF MULL –
## What is special about its plants, butterflies and moths

By Lynne Farrell (plants) and
Tom Prescott (butterflies and moths)

**Background and habitats**

Mull is a very popular destination amongst naturalists. This is highlighted by the presence of several wildlife tour guides operating on the island; however, the vast majority of these visitors, whether travelling independently or on an organised tour, are there to see one or more of the big four: sea-eagle, golden eagle, otter and cetaceans. Most are rewarded by distant views of their quarry as small, dark specks. Unfortunately few seem to be interested in, or are aware of, the far more colourful wildlife at their feet, the plants, butterflies and moths. This article hopes to redress this imbalance.

Ben More (Mull's highest point), coastline, flag iris and foxgloves © Lynne Farrell

Mull forms part of vice-county 103, the Mid Ebudes, along with the neighbouring islands of Coll and Tiree. It is a relatively large island of c. 450 square miles of land, with a similar area of surrounding sea-bed. It is a very diverse area, with many islets, so if you like messing about in boats; this is the place for you. The highest point is Ben More at 3169ft. (969m), which is the only Monroe, but there are many challenging hills to tackle. The geology is mainly Tertiary basalt lavas, with some gneiss on the Ross of Mull and Iona, some granites, tertiary igneous rock in the central massif, and Mesozioc sediments around the southern coast (Stephenson, D.. *Mull and Iona - a landscape fashioned by geology*. 2005, SNH). It has a cool and oceanic climate with small temperature ranges throughout the year, a high rainfall and frequent, strong winds.

Upland lochan with Ardmeanach in the background © Lynne Farrell

Because of its geographical position and its topography the island supports a wide range of habitats: saltmarsh, sandy and rocky shores, coastal and inland cliffs, ravines, deciduous woodland, heathland, mires, bogs, flushes, lochs, uplands and plateaux. There are also anthropogenic communities: roadsides, walls, churchyards, cemeteries, jetties, old gardens, and a few arable fields, plus large areas of coniferous forestry plantations.

**Botanical Recording**

Between 1966 and 1970 the Natural History Museum, London, undertook a field survey resulting in the publication of "*The island of Mull - a survey of its flora and environment*" (Jermy, A.C. & Crabbe, J.A., 1978). This included not only flowering plants but also ferns, liverworts, mosses, lichens, fungi, freshwater algae, freshwater diatoms, and marine algae, so it still is one of the most comprehensive floras of modern times.

Since 1996 Lynne has been the Botanical Society of the British Isles (BSBI) vice-county recorder for VC 103 and has been recording the flora of Mull on a tetrad (2x2km square) basis. Depending on how many of the islets have vegetation growing on them and therefore might eventually be visited, the estimated total number of tetrads covering the island is 337. The best areas in terms of the variety and number of species are the coastal ones, but the uplands do have some special plants, which make the long walk-ins worth the effort, and the all-round views from the hills are wonderful. The richest tetrad is at the east end of the island of Ulva with 345 species recorded - this reflects the variety of habitats there, so if you want to see many of the Mull habitats, you could do so by following the excellent walks around this part of the island, accessible via the small foot-passenger ferry that goes on request from Ulva Ferry. By contrast, one of the tetrads with the lowest number of species, just 77, is not too far away at Cruachan Odhar, near Torloisk, comprising mainly of moorland, rock outcrops and flushes. This indicates how much variation can be found within a short walk; from the richest to the more basic.

Over 200,000 individual plant records have been entered into Mull's Mapmate botanical database, with many of these transferred to the National Biodiversity Network since 1996 and there are now only seven tetrads (the most difficult ones to access) left to record, which Lynne hopes to complete in 2013. "The New Flora of Mull", which hopefully will be published within the next five years, will compare the distribution of the species and the changes with the previous flora.

Whilst botanising, Lynne also records dragonflies and damsels, butterflies and day-flying moths, (plus a little moth-trapping), mammals, amphibians and reptiles, bumblebees and hoverflies and a few other noticeable and relatively easy to identify insects. Birds are well recorded by the local bird group and many visiting ornithologists, (Spellman, A., *Isle of Mull Bird Report* and species list - annual reports), but species of particular interest and the movements of the golden eagle and sea eagle are also noted. All these records are fed into the national recording schemes, usually through the relevant recorder, each year.

(left) Iceland Purslane close-up - and (right) Iceland Purslane habitat © Lynne Farrell

**Interesting plants**

Beginning on the mountains, the rarest species in a GB context is *Koenigia islandica* (Iceland purslane), only found on the Ardmeanach peninsula, Mull, and on Skye. Growing nearby on the stony plateaux and rock outcrops are *Sedum villosum* (hairy stonecrop), *Saxifraga oppositifolia* (purple saxifrage), *S. aizoides* (yellow saxifrage), *S. stellaris* (starry saxifrage), *Saussaurea alpina* (Alpine saw-wort), and minute plants of *Botrychium lunaria* (moonwort). On the summit ridges *Carex bigelowii* (stiff sedge), *Salix herbacea* (dwarf willow), *Luzula spicata* (spiked woodrush) and *Arabis petraea* (northern rockcress) are found, often only reaching a height of a few centimetres due to the exposure and the frequent wind-pruning.

Coastal cliffs, mainly eroded and crumbling basalt, are some of the most rewarding areas to explore but care is needed. Many of these areas are grazed by sheep, red deer and feral goats, so the 'goodies' are often confined to the more inaccessible parts including the ravines; a pair of binoculars is an essential item. *Orobanche alba* (thyme broomrape), *Vicia orobus* (Wood Bitter-vetch), *Gentianella campestris* (field gentian), *Carlina vulgaris* (carline thistle) and *Osmunda regalis* (royal fern) can all be spotted.

(left) Thyme Broomrape and (right) Moonwort © Lynne Farrell

The deciduous woodland, mainly hazel and oak, is a moist habitat, often with large boulders underneath, so you need to visit before the midges get going. Mosses, liverworts, lichens and filmy ferns abound here. The rare fungus *Hypocreopsis rhododendroni* (hazel gloves) grows in orange/brown circular patches on ancient hazels, especially near the sea. Both filmy ferns *Hymenophyllum tunbrigense* (Tunbridge filmy-fern) and *H. wilsonii* (Wilson's filmy-fern)

cling to the tree stumps and rocks. Occasionally, *Cephalanthera longifolia* (narrow-leaved helleborine) is found scattered on south-west facing slopes, usually in dappled shade. Mull has several good populations of this nationally scarce plant, the most accessible colony being in the woodland trail at Calgary. In Aros park near Tobermory, many introduced exotics and plants of garden origin mingle with the native species. Walking along the shore path from Tobermory into the woodland, *Neottia nidus-avis* (bird's-nest orchid) and *Pyrola media* (intermediate wintergreen), both extremely rare on the island, can be seen right beside the path.

(above) Narrow-leaved Helleborine and (below) Hazelwood with ground flora, and the fungus Hazel Gloves © Lynne Farrell

Much of the land is grassland, moorland and heathland, so it is no surprise that the more interesting species in these habitats are sedges, grasses and rushes. *Carex magellanica* (tall bog-sedge) is only known from a few spots on the remote Laggan deer peninsula in the south-east, whilst *Carex paniculata* (greater tussock sedge), and *Carex lasiocarpa* (slender sedge) occur in patches of standing water. *Carex pauciflora* (few-flowered sedge) is scattered in unremarkable moorland areas, but *Rhynchospora fusca* (brown beak sedge) is restricted to Coladoir Bog, an Special Area of Conservation (SAC) and Special Protection Area (SPA) in Glen More. In flushes *Anagallis tenella* (bog pimpernel), *Hypericum elodes* (marsh St. John's wort) and all three subspecies of *Dactylorhiza incarnata* (early marsh orchid) can be seen in flower in May and June. In a very few places, often where there is cattle grazing and near to the coast, *Spiranthes romanzoffiana* (Irish ladies-tresses) occasionally flower. So keep your eyes open as there is always the chance that you will find a new site.

There are, of course, many sea lochs and freshwater lochans, so emergent and aquatic plants are relatively widespread. Some of the rarer ones include the tiny *Subularia aquatica* (awl-wort) on the shores of Loch Baa, and the unexpected *Teesdalia nudicaulis* (shepherd's-cress) on the river gravels in Glen Forsa. Loch Poit na h-I, near Fionnphort, is the best site for pondweeds with some of them not found floating around elsewhere on Mull, for instance *Potamogeton lucens* (shining pondweed) and the hybrid *P. x zizzi* (long-leaved pondweed). *Nymphaea alba* (white waterlily) and *Cladium mariscus* (great fen sedge), neither of them common on Mull, also occur around the margins.

Malcolm's Point, south-facing cliffs – also Transparent Burnet Moth can be found on top of these © Lynne Farrell

**Lepidoptera recording**

Alan Skeates, who lives in Craignure, is the butterfly and moth recorder for the island. Although a new recruit and very new to the world of lepidoptera, Alan has done a fantastic job collating and verifying records. The Vice County 103 list currently stands at 750 species, which comprises 23 butterflies, 365 macro-moths (one for each day of the year!) and 362 micro-moths. The Mull lepidoptera database at the end of 2011 comprised around 25,000 macro-moth records and about 6,000 butterfly records.

Unlike for plants, a systematic survey of the island of its lepidoptera has not been undertaken, and as a result there are only a few hotspots, e.g. Craignure and Treshnish, which simply reflects the efforts of one or two active recorders who live in these locations. This means that the rest of the island has been recorded on an *ad hoc* basis resulting in some very under-recorded locations, particularly in the more isolated and remote parts of the island. Targeted recording has been successful in finding new colonies of some of the rarer species, particularly the burnets and marsh fritillary and thus reiterating how the island's lepidoptera is under-recorded making further surveying even more crucial and exciting.

There has certainly been an increase in recording on the island and it can now boast at least six residents who trap regularly. This is reflected in the increase in the number of new species recorded from the island which includes 43 new macro moths since 2006. This also highlights the fact that, until Alan took over the role, there was not a definitive Mull macro-moth list despite ones being compiled for many of the other Inner Hebrides including Canna, Rum, Coll and Colonsay, mainly by Peter Wormell. In addition, more visiting naturalists are bringing their moth traps with them to Mull, or make good use of traps that Alan loans out for anyone to use. So the list is set to grow alongside our understanding of Mull's butterflies and moths, their distribution and status.

**Interesting Lepidoptera**

The island's priority butterfly is undoubtedly marsh fritillary, which along with populations on Islay, Lismore and the neighbouring coastal fringe of Argyll are some of the most important colonies in Europe.

Marsh Fritillary © Peter Eeles

Below - The distribution of Marsh Fritillary to 2011.


The marsh fritillary is a very attractive species that is on the wing from the end of May through into July, when the females seek out abundant patches of devil's-bit scabious, the sole foodplant of their caterpillars in Scotland, to lay their egg batches. This is vital, as the communal caterpillars live together from late summer through to the early autumn in webs before hibernating and re-emerging in the spring. They therefore require a sufficient supply of scabious, as caterpillars developing on isolated plants will fail due to lack of food. The butterfly occurs on damp farmland and moorland and is reliant on light grazing, particularly by cattle, to ensure that there is an abundance of scabious and thus that sites remain in suitable condition. Several new colonies have recently been discovered on the island, particularly along the east and northern coasts and on the Ross of Mull.

Other butterflies that can be scarce elsewhere in many parts of the UK, but common on Mull, including grayling, green hairstreak, common blue, Scotch argus, small pearl-bordered fritillary and dark green fritillary. Intriguingly there have been unverified records in the last few years of both chequered skipper and purple hairstreak from Mull; it would therefore be great to confirm their presence on the island. Similarly there are old records of pearl-bordered fritillary from the Loch Baa area, which also has suitable habitat for chequered skipper. The only other site on the island for pearl-bordered fritillary is on the steep south facing coastal slopes on the Ross of Mull at Aoineadh Mor, where the butterfly was discovered in 2006.

In addition, Mull is a very special place for the brightly coloured day-flying burnet moths. Along with the neighbouring islands of Ulva and Gometra, Mull holds the only sites in the UK for the slender Scotch burnet moth, whilst the transparent burnet also occurs on Mull and is now confined in the UK to only around twenty colonies along the west coast of Scotland from Skye to the Mull of Kintyre. The mild climate of the west coast, combined with the herb-rich vegetation, warmth and shelter particularly of south-facing basalt under-cliffs, seems to provide ideal conditions for these beautiful day-flying moths. Burnets emerge in high summer and live in colonies, often clustering many to a flower-head, making them both conspicuous and attractive. The young caterpillars also enjoy basking in the sun to keep warm and speed their digestion. However, they themselves are also part of the food chain but their brilliantly contrasting colours are a warning to would-be predators that they are poisonous. Excitingly, two new populations of slender Scotch burnet have been found on Mull in the north of the island in the past five or so years, and the moth has been found to be more widespread on both Ulva and the Ardmeanach peninsula.

Above (left) Slender Scotch Burnet © John Knowler and (right) Transparent Burnet © Stephen Mason;

Below (left) Forester Moth © Mark Parsons and (right) Ringed Carpet © Alan Skeates

Three other scarce day-flying moths occur on the island: the excellent bumblebee mimic narrow-bordered bee hawk-moth, the black and white argent & sable, and forester moth, a green burnet moth, although the latter has not been recorded for over 20 years.

(left) Bordered Grey and (right) Barred Tooth-striped © Alan Skeates

The lack of light pollution along with the quality of Mull's habitats particularly woodland and moorland often result in good moth catches of many of the commoner species. Coastal species include the very rare grey moth, with Mull and Skye, along with the Isle of Man, being the few locations with recent records in the UK, the caterpillars feeding on sea campion. The few areas of machair on the island, mainly on Iona and the Ross of Mull, support belted beauty, one of the few moths with flightless females. A similarly scarce species, particularly in Scotland, is the bordered grey, it first being discovered on the island in 2011. Other scarce species that can be found on Mull include yellow-ringed carpet,

associated with saxifrages and sedums, barred tooth-striped that feeds on ash, ringed carpet, particularly where there is bog myrtle, and slender-striped rufous that is associated with damp flushes.

As in many parts of Scotland the micro-moths on Mull have received far less attention, but far more interest is now being shown in them by both the resident and visiting lepidopterists. For example in 2010 Bob Heckford visited the island to look for *Plutella haasi* and finding the larvae on *Arabidopsis petraea* (northern rock-cress) on the slopes of Ben More at over 800m. Bob's endeavours have now found the moth to be present at four localities in three vice counties in Scotland and is an interesting case of a very rare moth being associated with an almost equally rare plant.

Langamull with Rum in the background. Participants on a Butterfly Conservation Scotland outing © Tom Prescott

**Threats/Changes**

Recent changes over the past 30 years include further planting of conifers, with many now at the clear-felling stage. Sheep numbers swelled, but are starting to decrease a little, as are cattle, whilst deer are certainly on the increase. Bracken certainly seems to be on the march and is causing some concern particularly where it is encroaching into species-rich areas. At Kilninian, on the west coast of Mull, and probably elsewhere, a creeping form of cotoneaster has become established and has severely reduced the amount of suitable habitat for slender Scotch burnet. As a result, Butterfly Conservation Scotland (BCS) have been clearing the cotoneaster using both local volunteers and contractors, and this summer the moth was recorded at the site for the first time in four years. In addition, many farmers, with assistance from Scottish Agricultural College (SAC) and BCS, have entered their land into Rural Priorities, Scotland's agri-environment scheme, specifically to manage for marsh fritillary and/or burnets moths. So it is comforting that these sites will be managed sympathetically for at least the next five years, whilst the farmers are receiving payment incentives to do so. To highlight the green credentials of many of the farmers, last year the Charringtons, who farm at Treshnish in the north-west corner of the island, won the RSPB's Nature of Farming award and can proudly claim to be the UKs most environmentally friendly farmers.

Many more visitors are arriving, which means new building to accommodate them (and the locals). New car parks in the most scenic spots are springing up to ease the current problem of people stopping to view the scenery and the wildlife on the single-track roads, which often get eroded at the edges. New plants, many of disturbed habitats, are being found as a result.

So Mull is changing, and it will be interesting to see what happens in the next 40 years of recording. For further information please contact the authors.

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## The Girdled Snail, *Hygromia cinctella*, spreading in Scotland

By Adrian T Sumner

The Girdled Snail *Hygromia cinctella* © Adrian T. Sumner

The girdled snail, *Hygromia cinctella*, is a Mediterranean species that was first recorded in Britain in 1950 at Paignton in Devon, and for many years remained restricted to the south-west of England. More recently it has appeared in South Wales, and has started spreading north. The National Museum of Wales has set up a project called Snail Search to monitor the spread of this species, and results can be seen on their website (www.museumwales.ac.uk/en/scan/snails/).

The first girdled snail in Scotland was recorded by Richard Weddle in Glasgow in 2008. Since then there have been no further Scottish records of this species until this year, when I have found them at Livingston in West Lothian, in Edinburgh, and at St Andrews in Fife. It looks as if this species in really beginning to spread in Scotland.

The girdled snail is quite distinctive and generally easy to identify (see above). The shell is conical, with a distinct keel which is whitish. The ground colour of the shell is brown, usually quite a rich medium shade of brown, but not infrequently paler. The adult shell is about 10–12mm in diameter. Look out for it on waste ground, roadsides, gardens and similar habitats, where it may be found under debris such as pieces of wood, or on walls. Records may be sent to the Conchological Society Non-marine Recording Scheme (nonmarine@conchsoc.org), and I should be happy to look at any specimens or photos if you are doubtful about identification (adriantsumner@btinternet.com). It will be interesting to record the spread of this snail across Scotland; maybe it is already present in your area!

Adrian T. Sumner

# Gateway and NBN News and updates - Autumn 2012

**New NBN Gateway version 5 launch**

A new version of the NBN Gateway will be launched on the 17th December. Version 5 will incorporate a more user-friendly and flexible set of data access controls, significantly improved data download functionality, better feedback for data providers and an entirely new technical infrastructure, which will improve stability and performance.

There will be two more rounds of data loading before the launch. Data providers will be able to change public and enhanced access levels to current datasets until a week before the launch of the new system, and we are happy to provide help with this. Please note the following schedule:

- Final dataset submission date for upload in October – 19th October
- Final dataset submission date for upload in November – 16th November
- Deadline for changing access to datasets before the launch of Gateway v. 5 - 7th December
- Launch of Gateway v. 5 - 17th December

We would like to thank all data providers for the time and effort spent on dataset administration to ensure a smooth transition to the new system. We appreciate this and understand how valuable you time is.

The NBN website now has a set of pages explaining everything that data providers and data users need to know about the new system of data access controls Hhttp://www.nbn.org.uk/Share-Data/Data-access-controls.aspxH You can also contact us on Haccess@nbn.org.ukH with any questions.

**New data from the Clyde River Foundation.** The Clyde River Foundation is a Scottish registered charity which researches the ecology of the Clyde and its tributaries, and promotes environmental education throughout the catchment. The aim of the Clyde River Foundation is to improve understanding of all aspects of river management and in particular to provide a permanent, professional fisheries science presence in the catchment. In September, the Clyde River Foundation supplied three datasets to the NBN Gateway at full public resolution, showing the national Scottish distribution of three species of fish: Allis shad (*Allosa allosa*), Twaite Shad (*Allosa fallax*) and Bullhead (*Cottus gobio*).

**Did you know?**

**NBN Conference**

Have you already booked your place at this year's NBN Conference? If not, and if you are a member of the NBN, you are eligible for one or more free places!

Refer to the membership pages on the NBN website for more information about member benefits and the conference discounts that are available Hhttp://www.nbn.org.uk/The-NBN/Membership.aspxH

The Conference takes place on Friday 23rd November at The Royal Society, London and the theme is "Biological Recording – fit for purpose?" The cost is £50 and the full programme can be found on the NBN website at Hhttp://www.nbn.org.uk/Events/Events-and-Training/Seminars-and-conferences/NBN-Conference-2012.aspxH

The Conference is kindly sponsored by the Mineral Products Association and the booking deadline is 2nd November.

**In Practice**

**NBN Gateway data helps ClimateXchange Scotlsnd**

University of Aberdeen and ClimateXchange Scotland recently contacted the NBN Gateway team for a custom-download to help them gather information on Scottish BAP records.

ClimateXchange Scotland is trying to provide expert advice on current and future land-use policies. One of the current policies is to increase woodland cover across Scotland by approximately 25% and the are investigating where extra woodland should be best positioned. This takes into account many different ecosystem services, of which biodiversity is a vital one. These data will inform general strategy and will be presented as part of an analysis that takes into account many different ecosystem services. This may be published in the scientific literature as well as reports for the Scottish Government.

**PlantTracker app**

The Environment Agency and University of Bristol have launched a new version of their PlantTracker smartphoone app to record the distribution of invasive plant species in the UK. The project involves key partners including the Centre for Ecology and Hydrology (BRC) and the Non-Native Species Secretariat in order to ensure that the data collected is available for those that really need it.

The new version of the app is now UK wide and features 14 invasive plant species. The main focus is on aquatic and riparian species and the app has already begun to reveal interesting records and has alerted key organisations to the previously unknown presence of invasive, non-native species in their areas of responsibility.

The app is available for both the iPhone and Android platform and can be accessed from the PlantTracker website: Hhttp://planttracker.naturelocator.org/

There is a results page which provides a quick overview of results but it should be noted that the data is available to anyone that needs it and will filter through to the NBN Gateway once validated. The only ingredient required is that lots of people use it and record invasive plants!

Future developments will include a BlackBerry version, more key species (suggestions welcome) and a way to record if the outbreak is under treatment so that effort is concentrated on previously unknown sites.

**iRecord launched**

July saw the launch of iRecord, an online recording website built using Indicia and hosted by the Biological Records Centre: Hwww.brc.ac.uk/iRecordH iRecord also acts as a portal for the centralised verification of data captured through many other online recording websites and smartphone applications. Experts appointed by national recording schemes can log into iRecord as a convenient 'one stop shop' to view and verify data captured through many different portals. Experts can also be setup as verifiers for specific surveys. *The goal of iRecord is to make it easier for wildlife sightings to be collated, checked by experts and made available to support research and decision-making at local and national levels, while enhancing the recording experience for recorders*

iRecord is being developed byH Biodiverse ITH and the Biological Records Centre on behalf of the National Biodiversity Network (NBN), through funding from the Big Lottery Fund project OPAL, the NERC Centre for Ecology & Hydrology, JNCC and Defra. Discussions with a number of national recording schemes and the Association of Local Environmental Records Centres helped shape the development of the site.

This is the first version of the iRecord site and the existing functionality is rebust for submitting your wildlife sightings. Further developments and improvements are already underway, and we welcome feedback from users via the iRecord forum.

**A new use for NBN Record Cleaner rules**

Several national recording schemes have developed verification rules for NBN Record Cleaner, the free decision-support tool for data managers. These verification rules have recently been incorporated into iRecord to help experts check the quality of new records more efficiently

The verification rules are used to run regular automated checks to highlight records which are outside the known spatial or temporal range of the species, as wel as records of species which are inherently difficult to identify. Verifiers can see the results of the automated verification checks for each record, and can also filter data to find records which have been flagged by the automated checks.

If you would be interested in verifying data through iRecord, please contact HiRecord@ceh.ac.ukH You can find out more on NBN Record Cleaner on the NBN website.

## CORRESPONDENCE

*The comments below were received in response to matters published in the July issue of* Recorder News.. *Please note that the editor is always keen to publish any correspondence arising from the newsletter. ed*

**Siskins**

We can add to Chris Smout's and Alistair Shuttleworth's stories of an unusually large autumn movement of siskins in 2011 (*Recorder News* 83:7, 86:2). We used to have a resident population of siskins on the outskirts of Dufftown at 200m on the NE side of the Cairngorms when we were surrounded by conifers, but have only seen them occasionally since most of the trees were cut down. We saw none in the cold weather of the 2010-11 winter, and few in the early spring. Then in the late spring we were invaded by a mob of hundreds, apparently mainly fledged families, which fed socially at our feeders and in the fields round about. Then after two or three months they all disappeared again, which ties in with the exodus through Fife. We saw few last winter, but more, including families again, when the leaves came out. Has this got something to do with the strength and progress of the cone crop?

Bill Bourne
wrpbourne@yahoo.co.uk

**Hazel nuts**

The long review of the Coppins' hazel book (*Recorder News* 86: 13-15) omits to mention when they may have been most important to man. The nuts seem to be the most durable vegetable remains from his hunter-gatherer period after the last glaciation, when hazels were apparently prominent among the first trees. Presumably the nuts lasted into the winter, and their shells have lasted ever since.

Bill Bourne
wrpbourne@yahoo.co.uk

**Reply** from Peter Quelch

As hinted in the review, the authors constantly play down the influence by man in plant distribution or woodland structure. By contrast I am currently reading a rather large book titled *The Rural Landscapes of Europe* by Urban Emanuelsson, with sub-title 'How man has shaped European nature'. He discusses the early spread of hazel after the glaciers retreated and makes the point that man was probably influencing this process right from the start. Not only have hazelnuts always been an important food source - from the Palaeolithic to the present day - they were easily carried on long journeys and may have been spread by mistake, or on purpose. Of course they were so valuable because they store fairly easily right through the winter, as well as being robust and portable. Emanuelsson considers that hazel seems to have spread more quickly in Europe than was possible with the help of squirrels, jays and nutcrackers. He also reports that there is a lively debate among archaeologists about the importance of the hazel, and also the wild apple, as a source of food during the Neolithic.

## PROJECT REPORTS

### BRISC / GNHS BURSARIES

*For this issue we have received another two interesting reports from the 2012 Bursary recipients. It is obvious from their reports that both found their chosen courses extremely valuable as well as very enjoyable. It is the firm intention to offer another set of bursaries for 2013. Details to be published in the January issue of* Recorder News *ed*

**Spider Identification Course for Beginners, at Kindrogan Field Studies Centre 29 June-2 July 2012**

By Ian Boyd

Following kind support form Biological Recording in Scotland and Glasgow Natural History Society, I attended a Spider Identification Course at Kindrogan Field studies Centre under the excellent tutoring of Alistair Lavery.

Possibly, like many people, I have a particular curiosity about spiders without knowing much about them. Spiders seem to have a connection to the human psyche. Even if some people are put off by them, they may have an interest in this group of invertebrates, even more so than other groups, and if that interest became informed knowledge - even to some extent – people may grow to have a better relationship with this much maligned group.

I am in a position to help people learn about all aspects of the environment, and as a Countryside Ranger I could offer information whenever the opportunity arises, especially if I knew more myself.

The course began with a perspective into the extent of spiders, not only British spiders but spiders world wide (Alistair was particularly well placed to do this as he is a spider recorder for the Falkland Islands); then basic anatomy to note the necessary microscopic markers needed for identification. During the weekend, different methods for collecting were tried: simple field techniques such as pit fall traps, beating low vegetation and sweeping meadows, and room windowsills were of course handy for the usual suspects in our houses. We also looked at what information was necessary for storage and recording. Fixing specimens in alcohol is necessary to be able to identify them to species level.

Now with this basic knowledge I can start my own collection and over time record what species can be found in my area, again this group, as many others, seem to be under recorded. The Linyphidae (money spiders ) are the largest family group with the smallest specimens, hardly noticed, although actually, under the microscope they are beautiful animals with wonderful colours, patterns, body shapes and appendages to keep you marvelling and amazed for hours (maybe).

Since my main interest is education, it was great to hear the interesting trivia about spiders that Alistair had to share. He was from an education background himself and had the stories to keep spiders interesting. So seemingly we have the identification of the 'Robert the Bruce Spider' sussed, and there **is** such as thing as a vegetarian spider!

For your own information the British Arachnological Society is a good site to head to, to get yourself started, with plenty of good pictures.

**Invertebrate Surveying Techniques course, at Kindrogan Field Centre - 21-25 August 2012**

by Dave Holloway

I work full time in the National Health Service, but Natural History is my passion, and my main taxonomic interest is spiders. I have limited time and want to make my collecting as focused and effective as possible to maximise the value of the records. I have a particular interest in the Scottish hills, where there are some interesting but under-recorded species. I was hoping that this course would help me with this interest

and was very grateful for a bursary generously provided by BRISC and Glasgow Natural History Society.

The course consisted of many forays outdoors supplemented by indoor lectures and identification sessions. Away from the classroom many techniques were demonstrated and practiced. These included light trapping, wine roping, beating (including how to tackle tall trees), searching by torchlight, pan trapping, sweeping, vacuum sampling, pond dipping, and using aquatic bottle traps. Much of this was within the vicinity of Kindrogan but one day was largely devoted to a field trip on Glas Maol. This expedition was a real highlight. In addition to seeing dotterel, ptarmigan, golden plover and mountain hares we were privileged to do some collecting. I was pleased to get some spiders, which included *Erigone tirolensis*, a small dark Linyphiid spider, which is a montane specialist. It is a particularly handsome creature under a microscope and in certain lighting conditions the blue-grey sheen on its blackish abdomen reminds me of a blueberry. I was also interested in the completely different sets of spider species that were found by vacuum sampling the short vegetation and by searching under stones. Only *Centromerus prudens* was found by both methods and even then only by the efforts of some of the group to vacuum amongst stones. Some of the group felt that the best beast of the day was the pseudoscorpion under the summit stones. One of the group, Andy MacGregor later identified this as *Neobisium carcinoides*.

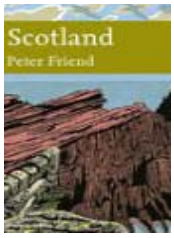
Hoovering the hills; collecting on Glas Maol. © Jeff Clarke

Andrew Earl examining a catch from the 'Supersucker' at Kindrogan. © Jeff Clarke

The first major learning point for me was the value of vacuum sampling as a method for obtaining spiders from short vegetation. I had previously dismissed this as too expensive, noisy, unwieldy, and disruptive to plants. In fact the 'supersucker', as it was affectionately known on the course, only confirmed the first of my assumptions. The noise is very transient and it was not too difficult to carry (although we did take it in turns). However, where it really scores is that it is actually very gentle on the vegetation, certainly much less so than sweeping. I suspect that if I am to progress to some work that monitors spiders in a systematic, repeatable way, then the 'supersucker' will form an important part of that.

My other major learning point was a reminder of the value of sharing an enjoyable activity with other like minded people. Jeff Clarke, the course leader, was an excellent communicator and passed on vast amounts of practical knowledge with amazing enthusiasm and generous doses of anecdotal humour. The group responded to the atmosphere that Jeff created by immersing ourselves in the world of 'inverts' with growing interest. There were seven of us from a mixture of backgrounds and origins. People had travelled from as far away as Devon, Ireland and Jersey. A great and productive time was had by all. So if at anytime your recording hits a lull and you need a boost I can highly recommend Jeff's courses,
(http://www.jeffclarkeecology.co.uk/ )
and the Kindrogan environment (http://www.field-studies-council.org/centres/kindrogan.aspx ).

## BOOK REVIEWS




**Friend, Peter (2012) *Scotland*. New Naturalist Series, HarperCollins Publishers, London. Hbk ISBN 978-0-00-735906-6 £32.50. Kindle edition £19.99**

I was intrigued by the title of this book, what would it be about? All of Scotland's nature, its history, everything? I should have looked more closely at the cover picture and that would have given me a clue, as it is of Hutton's unconformity at Siccar Point in the Borders. Another clue would have been the 108th New Naturalist entitled *Southern England: The Geology and Scenery of Lowland England* by Peter Friend.

Dr Friend grew up in Scotland but since his days as an undergraduate, and now as an Emeritus Fellow, he has spent his academic life at Cambridge University. He has used his great knowledge to provide a systematic general review of the landscapes visible in Scotland.

The first five chapters cover the processes that have formed the rocks that make up Scotland and the processes that have altered them. There are many illustrations to explain processes such as how 'wave cut platforms' are formed, the deposition of the different ages of sandstones in Scotland, and also useful diagrams indicating how much the sea level has changed in the last 15,000 years. These along with an accessible writing style allow the lay person to gain a good understanding of just how what we see now had been formed.

These chapters are only intended as a summary of very complex events and there is an extensive bibliography, should you wish to study these processes in more depth. I would venture to say that these are a very good summary of the last 3 billion years in relation to Scotland's geological and geomorphological processes. This sets the scene for the meat of the book, the regional gazetteer.

The next 19 chapters look at Scotland, broken down into a grid of 19 squares covering roughly similar landscapes, and therefor not as arbitrary as the author suggests. These will be the part of the book of most interest to purchasers, as it goes into depth about why your local area looks the way it does. Starting with the bedrock and finishing with the Ice Age, erosion and weathering. These chapters are really interesting and do provide a new insight into landscapes which, on the whole, we take for granted have always looked the way they do now.

The landforms and landscapes of Scotland are the foundation for the soils and habitats found here, and it is therefore very important that naturalists have an understanding of why certain areas are the way they are, because it gives an added perspective to your local area and also Scotland as a whole.

The final chapter is an overview of the movements of the land masses that make up the British Isles relative to each other and to other continents, to explain the timing of four key steps in the creation of Scotland's landscapes. Although this is a simplification, it does make sense of what we see in Scotland in its entirety, and it also explains why Scotland is so different in terms of landscape within its borders and in comparison with England and Wales, but not so much with Northern Ireland. For those interested, the four steps are: the Caledonian Mountain building (most of the Highlands), the Pangean drift from south to north (Scotland joined with the English land mass at the start of the journey), Atlantic Plate Divergence (all the Terteriary volcanoes of the west coast, Skye, Rum, Mull, etc.) and finally the Ice Ages.

I really enjoyed reading this book, dipping in and out of the regional chapters and finding snippets of explanation that made me go, "well of course that is why it looks the way it does!". But it took this book to make me realise this, and then start questioning myself as to why I had not been curious about it before. This is a book that encourages curiosity and is full of lucid and interesting explanation. Do read chapters one to five and the overview all in one go, and then dip into the area chapters; you will be rewarded with some fascinating new knowledge about Scotland.

PS. An unconformity is two layers of sedimentary rock of different ages at different angles to each other. This indicates that below-ground movements have occurred to the older and lower rock since its deposition. It was all part of the Pultonism vs Neptunism debate in the 18th century.

Jonathan Willet


**Clifton, John & Wheeler, Jim (2012). *Conifer Moths of the British Isles.* Published by Clifton & Wheeler. ISBN 978-0-9568352-1-5 (softback) £20.00**

This is a book that does not centre on a particular family or group of families: as the title suggests, it is an identification guide for those moths, regardless of lineage, whose larvae feed on coniferous trees.

The introduction is short and points out that the book concentrates on monophagous species, whose larvae feed exclusively on plants of the families *Pinaceae* and *Cupressaceae*. There is a short list of trees included – for example, firs, cedars, larches, spruces and so on. The content and layout of the species accounts are briefly described along with the advice that not all examples can necessarily be determined without retaining a specimen for closer examination. A single paragraph of acknowledgements reads like the who's who of contemporary lepidopterists, including a number of well-known and respected Scottish-based names, such as Keith Bland, Roy Leverton and Mark Young.

I find that it is always useful to be reminded of the technical terms used in species descriptions and an excellent morphology picture is included, clearly showing what is meant by tegula, basal fascia, strigulae, etc.

Before the actual species descriptions, the 94 featured species are listed by page number, followed by a short note on their eleven families – for example "Gelechiidae: page 20. Generally very small moths with narrow, fringed wings." With more than 4,500 species worldwide, only five conifer-feeding species are found in the British Isles."

And so to the species accounts. In general, each species has a single dedicated page. With a couple of exceptions, the account includes a pair of good size photographs, approximately 6x4cm, of a specimen at rest and of a set specimen. The set specimen is annotated with distinguishing features that are further described in accompanying text. There is also a clear indication of flight season, using both a histogram and a calendar strip. The calendar strip shows the months in a row along the full width of the page, with the flight season highlighted in a different colour for each stage. Another diagram shows the actual size of the moth against a mm rule. Something that no guide should be without is a decent set of distribution maps, and here we get a very clear picture of distribution by Vice County.

The text contains four headline statements on wingspan, flight period, foodplant and national status. The definition of national status is helpfully described in the introduction. For example, Nationally Scarce A is defined as occurring in only 16-30 10km squares.

Then there are upto four additional paragraphs that expand on the diagnostic features highlighted in the photographs, and any additional differentiators from similar species. There can be a further note on distribution and a paragraph on foodplant and general behaviour. For example, "Adult moths fly in bright sunshine from late morning… Beating the foodplant may be more successful than light trapping… The larvae traditionally feed on common juniper, feeding from leaf to leaf in September to May, spinning the leaves together."

In some cases, additional photographs and illustrations are included to show specific differences between confusion species. One good example of this is a plate showing willow beauty, Lydd beauty and mottled beauty together. Interestingly, these are included even though they are NOT monophagous, but because they might be confused with feathered beauty, which is. Other polyphagous or even non-coniferous species are likewise included where it has been thought prudent, because of similarities to the featured species, bringing the total number of moths described to 108.

After the species accounts there are seven pages of 'thumbnails' showing 104 of the species in a very useful quick reference index. Finally, there is a short list of other polyphagous species, a list of common and scientific names of relevant foodplants, more acknowledgments, references and some useful websites.

I had occasion to use this book myself when carrying out moth surveys in a mixed forestry plantation this summer, and I found it a very welcome addition to my library. It is compact enough to qualify as a true field guide; the content is focused, clear and consistent; photographs are of excellent quality and clearly show salient features. This is a book written by enthusiastic experts, for fellow enthusiasts, be they peers, protégés, enthusiastic amateurs or absolute beginners. There are only positives to say about the book and I thoroughly recommend it to everyone.

Duncan Davidson