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Recorder News

Banded snails (*Cepaea* spp.) and the Evolution

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**Banded snails (*Cepaea* spp.) and the Evolution
Megalab**

By Adrian T. Sumner

The shell polymorphisms of the brown-lipped snail (*Cepaea nemoralis*) (Figure 1) and the white-lipped snail (*Cepaea hortensis*) (Figure 2) have been a subject of great interest for at least 150 years. There are two conspicuous polymorphisms: shell colour, which can be yellow, pink or brown, and banding, which can vary from none to five bands (Figure 3, p.3). Even a century

ago it had been shown that these polymorphisms were under genetic control, but until the 1950s it was generally believed that the polymorphisms were selectively neutral (Cook, 1998). Since then, however, a large body of evidence has been accumulated, especially by Arthur Cain and his colleagues and pupils, indicating that selective forces are at work to maintain the different patterns. One such factor appears to be predation by song thrushes, and possibly other birds, which are believed to take snails that stand out most from their background; different morphs (colours or banding patterns) would be taken selectively depending on the local background (e.g. woodland or seashore).

There are also associations between different morph frequencies and climate (Cook, 1998). Yellow shells are commoner in warmer parts of the species' range, and dark brown shells are more found in more northerly areas. Shells with dark bands heat up faster in the sun than those without bands and could therefore become more active in colder conditions.



Figure 1 (left): A multi-banded specimen of *Cepaea nemoralis* with pink ground colour, from Aberlady, East Lothian.

Figure 2 (right): A multi-banded specimen of *Cepaea hortensis* with yellow ground colour, from near Brora, Sutherland. © the author

As well as selective factors that affect the polymorphisms, there are also 'area effects', where a particular frequency of morphs extends over a considerable range without any apparent relationship to habitat (Cain & Currey, 1963). The morph frequencies change abruptly at the border with a different area.

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Notes from the Chair

I have recently been involved with responding to the proposed Wildlife and Natural Environment Consultation Paper that was published by the Scottish Government a short while ago. One of its sections was dealing with 'Invasive Non-Native Species'. I have always found the question of non-native species, what is alien and what is invasive, as being fraught with considerable ambiguities.

In the plant world, in particular, there must be thousands of species which could not have arrived in Britain by natural migration and, therefore, have been introduced by artificial means. A very few of these have thrived, with no natural control on their expansion, to become 'invasive'; Japanese knotweed and giant hogweed to name but two. Sitka spruce is a non-native species to Scotland, which many might consider to have become invasive, but so also are larch, beech, and sycamore non-native, and these latter three would doubtless be considered a sad loss to the countryside if they were removed.

When it comes to animals there is the same problem as to what is considered acceptable or alien or invasive. Rabbits were introduced and in certain areas are certainly invasive. I hope I do not misquote her, but Mel Tonkin in her talk to our Conference this year said that our red squirrels were not native to Scotland, and I can certainly vouch for the fact that they can also become invasive and do considerable damage to trees. Deer feature very highly in Scotland, and there is concern that our red deer are losing their purity to cohabiting with Sika.

SNH recently held a Work Shop Day to consider whether we have the right 'protective' designations, i.e. SSSIs (Sites of Special Scientific Interest), SACs (Special Areas of Conservation), etc, and one of the points that was raised at the meeting was the question of whether we can keep areas as they were designated. The natural ranges of species are shifting as a consequence of climate change, the countryside is altering, and new species are appearing on the scene, sometimes naturally or sometimes with a little direct help from man/woman-kind.

I wonder if humans are not being decidedly two-faced about keeping things native and trying to control the introduction of species that were not originally resident here. After all, what has the human race been up to since time immemorial, other than inter-breeding around the world, both with willing help but also on occasions with considerable coercion!

It is not really for biological recorders to pontificate on what is non-native, or alien, or invasive, but it is their role to record all sightings, and for these records to be used to identify changes, which will in turn assist us on how we manage ourselves and our environment. There will be different perspectives on what should be considered native, non-native, alien or invasive as, with a changing climate, we are likely to see the environmental make-up alter.

Patrick Milne Home

October 2009

Deadline for the next issue of BRISC Recorder News is **17 December 2009**. All material, preferably in electronic format to Anne-Marie Smout [Hanne-marie@smout.org] or see postal address under BRISC Contacts



Editorial

Everyone will know that this year has been a 'painted lady' year. This well-known migrant may be seen in small numbers every year, but some years migration can be spectacular, and 2009 has been such a year. It may even be one of their greatest migration events ever, with vast numbers being recorded from every part of the British Isles (see http://www.ukbutterflies.co.uk/species.php?vernacular_name=Painted+Lady)

Early in the year reports came of people watching swarms of painted ladies passing the Isle of Wight, but here in Fife things really did not take off till much later. We had encountered a number of worn out individuals, but when their progeny took to the wings in August, it became truly amazing. On 22 August Chris, my husband, had accompanied me to Tentsmuir Point, where I do a butterfly transect, and as we walked through a stretch of heather, hundreds of butterflies rose into the air with every step we took. I was extremely glad Chris was with me to help with the counting, for it seemed quite impossible. We estimated 230 within the 5m transect line, but there were many more outside, including lots of peacocks and small coppers. It was quite magic and something I have never experienced except perhaps in a few Alpine flower meadows.

The sad news has come in that Charles Copp died on 24 September 2009. Charlie was one of the most influential people in pushing traditional biological recording into the computer age, and he was probably the most important brain behind the creation of the National Biodiversity Network. I met him regularly during his years as Chairman of the National Federation for Biological Recording and also when he came to Scotland to hear views on developments for the Recorder software and proposals for Local Records Centre accreditation. He was always friendly and approachable. His immense skill with computer programming will be sorely missed. An obituary will appear in the January issue of *Recorder News*.

The feature 'What is special about...' this time takes us to Lochalsh.. Local resident Brian Neath writes most interestingly about this magnificent area, showing how rich it is not just in scenery but also in its wildlife. For maps of the area consult the OS 1:50,000 maps nos 33, 24 & 25.

There are many other good things to read about in this issue, but make sure you make a note in your diary about next year's AGM and Annual Conference. This will be with a difference, for which see the prior notice on p.3. AMS

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Various other factors have also been suggested to maintain polymorphisms in these snails, so it is perhaps not surprising that Jones *et al.* (1977) referred to *Cepaea* polymorphisms as “a problem with too many solutions”. Nevertheless, selective predation and climate still seem to be the chief factors implicated in maintaining these polymorphisms.

A vast amount of data on the polymorphisms of *Cepaea* spp. has been accumulated over the last century or so, but with song thrushes declining in numbers, and constant references to ‘climate change’ (it is a cold, very wet morning in late August as I write), are the selective factors acting on *Cepaea* spp. changing, and if so is the polymorphic structure of *Cepaea* populations changing? 2009 is the bicentenary of the birth of Charles Darwin, and the 150th anniversary of the publication of *The Origin of Species*, and thus it seemed a very appropriate moment to carry out an evolutionary project. So the Open University, with support from the Royal Society and the British Council, and various bodies throughout Europe, set up the Evolution Megalab to encourage the public to go out and get up-to-date information on *Cepaea* polymorphisms. A wide variety of information is provided on the Megalab website (www.evolutionmegalab.org), which also gives instructions on how to participate, including recording sheets that can be printed off, a large amount of historical information, notes for teachers, and the names of all those involved in developing this project. Submission of records is entirely on-line, and there are maps on the website showing not only historical records, but also current records as they are submitted.

Taking part is pretty straightforward. As already indicated, the two species are quite easy to separate, at least when adult. In mature snails, the lip of the shell thickens and turns outwards a little; in *Cepaea nemoralis* it is coloured dark brown, which is clearly visible externally (Figure 1), while in *Cepaea hortensis* the lip is white; this is most clearly shown on the inside (Figure 2). If the animal stops you seeing the inside of the lip, poke it gently with a grass stalk or something similar, so that it retracts further into its shell. Note that immature shells have a thin lip and cannot be distinguished. Both species occur widely in southern Scotland, and quite often can be found together, but they become more coastal as one goes north. *Cepaea hortensis* is evidently tougher than *Cepaea nemoralis* and extends as far as the Shetlands; *nemoralis* is only very rarely found north of Inverness.

The polymorphisms are the same in both species, and are generally quite easy to recognise, but note that the ‘pink’ shell colour is usually a light pinkish-brown, although sometimes it may be a very distinct deep reddish colour. It is possible, therefore, to confuse pink and brown shells, but with practice the distinction usually becomes clear; the Megalab website gives further guidance on making this distinction. As already mentioned, the number of bands on the shell varies from none to five, though 0, 1 and 5 bands are commonest; sometimes the bands fuse together. For the purposes of the Megalab, however, you are only required to distinguish unbanded, single-banded, and multi-banded shells, which are all quite obvious categories. Occasionally you may find shells with light brown or even white bands, or the bands may be broken up into dots; the

Megalab instructions also tell you how to deal with these rather rare variants.

Autumn is a good time to go looking for both brown-lipped and white-lipped snails, as the populations are probably at their maximum, they are more likely to be out and about in the damp conditions, and for some reason they often make themselves conspicuous by climbing up dead vegetation, often in hundreds. And do not forget to record broken shells on thrush anvils; these, of course, are the snails that the thrushes have caught, and their polymorphisms may differ from the live population – indeed, they should do, if it is correct that thrushes selectively take shells with the more conspicuous patterns.

Happy hunting!



Figure 3. A collection of specimens of *Cepaea hortensis* from near Brora, Sutherland, showing yellow, pink and brown ground colours, and unbanded and multi-banded morphs. © the author

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Annual Conference & AGM 2010 – prior notice Saturday 27 March in Montrose

In 2010 BRISC will be exploring new avenues, both as regards theme and venue. The talks will focus on the wealth of historical biological information which can be gleaned from archaeological digs and fossils, and experts in different fields will tell us something about what they have discovered about the animals and plants that lived here in the past. There will also be the opportunity to join different excursions which will explore this very exciting area, with visits to Montrose Basin for birds as well as evidence of a tsunami, coastal woodlands and much more.

Make sure you put the date in your diary!

WHAT'S SPECIAL ABOUT LOCHALSH

By Brian Neath



Loch Alsh from Creag Reidh Reineach © the author

INTRODUCTION

Lochalsh is the southernmost corner of Wester Ross and is grouped with Skye as a district of Highland Region. The current administrative boundaries and the old county boundaries have diverged in recent years making biological recording somewhat confusing, especially when attempting to use the Watsonian Vice-Counties, which do not appear to correspond with either. So my local patch of Lochalsh is bordered by Loch Hourn in the south and Loch Carron in the north and has a tortuous eastern boundary zigzagging along wild remote mountains almost as far as Loch Mullardoch. Most of the area is included in Vice-County 105 (Wester Ross) but Glenelg and Arnisdale fall within VC97 (West Inverness).



Beinn Sgritheall - © the author

The area is a very popular destination for tourists, hill walkers, Munro-baggers, geologists, historians and the sailing fraternity. Attractions include Eilean Donan Castle, the Glenelg brochs, the Falls of Glomach (second highest in Britain), the Glen Shiel Battle Site, Plockton, and two National Trust for Scotland estates at Kintail and Balmacara. The numerous Munros include the Five Sisters of Kintail, the Saddle, the South Shiel Ridge, Beinn Attow and Beinn Sgritheall. There are also many superb

hills lower than 3000 feet which are strangely neglected but which often have more spectacular views than their more famous neighbours. Lochalsh is also one of the gateways to Skye via the Skye Bridge at Kyle of Lochalsh or by the small community-owned ferry at Glenelg.

HABITAT

The long complex rocky coastline meanders around the sea lochs and is separated from Skye by the narrow straits of Kyle Rhea and Kyle Akin. There are saltmarshes at the heads of Loch Duich, Loch Long and in Kirkton Bay. Glenelg has the only sandy beach, but there are a few small coral (maerl) beaches in the Plockton area. Three flat grassy islands (Eilean Tioram, Glas Eilean and Sheep Island) contrast with the numerous rocky skerries in Loch Hourn and around Kyle and Plockton.

The Balmacara Estate includes important areas of actively worked croftland at Drumbuie, Duirinish and Plockton. This consists of improved permanent pasture, pasture infested with rushes, crops, hay/silage, species-rich meadows and some unimproved ground adjacent to the active areas.



Kintail from View Point © the author

Between this agricultural area and the mountains of Kintail there are extensive areas of wild undulating grass and heather moorland gradually increasing in altitude as you head east. The open moorland is broken up by small patches of scrub, some areas of broadleaved and mixed woodland and several conifer plantations. There are also extensive areas of bracken and numerous small freshwater lochans. The mountain ranges are separated by broad straths along the Rivers Elchaig, Croe, Glenmore and Gleannbeag, once fertile but now used mainly for sheep grazing.

There are two biological SSSIs in the area and three geological SSSIs. Coille Mhor is an oak and birch dominated ancient and semi-natural broadleaved woodland. It is noted for its lichen flora, some of which are at their northernmost limits. This SSSI also includes Loch Achaidh na h-Inich which is designated as a Special Area of Conservation on account of it being a nationally scarce loch-type supporting at least 37 species of emergent, submerged and floating plants. These include long-stalked pondweed (*Potamogeton praelongus*) and six-stamened waterwort

(*Elatine hexandra*). The loch is also noted for its dragonflies. Coille Mhialairidh, which overlooks Loch Hourn, is an oceanic type acid oakwood and oak-birch wood also noted for its diverse lichen flora.

BIOLOGICAL RECORDING

Despite the wide range of habitats within the area it has never been a popular destination for naturalists and there is very little historical documentation of either the flora or fauna with the exception of the above SSSIs and the monitoring of golden eagle and black-throated diver populations. It seems that most naturalists, heading for the north-west, pass through Lochalsh on their way to Skye or the Western Isles. They may stop and scan Loch Duich or Loch Alsh, see little of interest and continue on their journey. Little do they know what they are missing.

I moved to Dornie at the beginning of April 1988 which happened to coincide with the start of the fieldwork for the British Trust for Ornithology's *New Atlas of Breeding Birds in Britain and Ireland*. So I spent a hectic but very rewarding four years covering a large number of tetrads and getting to know the area far quicker than I would have done otherwise. The mountains rise steeply from sea-level to over 3000 feet, providing a good variety of habitats which in turn result in a remarkable variety of species. Birds as varied as eider, red-breasted merganser, oystercatcher, ringed plover, greenshank, common sandpiper, ptarmigan, rock pipit, tree pipit, wheatear, stonechat, ring ouzel, grasshopper warbler, wood warbler, twite, yellowhammer and reed bunting could all be found breeding within a relatively small area.

Subsequently I joined the Highland Biological Recording Group (HBRG), which was in the process of producing a preliminary atlas of the butterflies of the Highlands, and this was followed by surveys of amphibians, bumblebees and beetles. Through taking part in these surveys I soon developed what within HBRG is affectionately known as an 'observer blob'. In such a thinly populated area as the Highlands the maps produced unfortunately tend to show the distribution of observers rather than the species being surveyed. Subsequent targeted efforts by HBRG has improved this situation in recent years.

An invertebrate survey of the Balmacara Estate was carried out by David Barbour in 1992 in which he recorded an impressive 204 species of macro-moth. Partly inspired by his report along with the number of interesting-looking moths that were attracted to the windows of our bungalow I began to record these moths during the winter of 1995/1996. By 2003 I had recorded some 170 species of macro-moth without the use of a trap. The subsequent purchase of a Robinson trap and further trapping around the Balmacara Estate has increased the number of macro-moths recorded in Lochalsh to almost 300. This includes a few moths identified by visiting lepidopterists. With the advent of the new National Moth Recording Scheme I was one of several people to be appointed as Vice-County Moth Recorders in the Highlands, in my case covering VC 105 Wester Ross and VC104 (Skye only). I have been pleasantly surprised by the number of visitors to these areas who have been moth trapping during the last three years.

The biological recording situation is gradually improving. The National Trust for Scotland is taking a more pro-active role in this respect and Iain Turnbull, the Property Manager, has had a range of surveys carried out, especially on the croft land at Drumbuie and Plockton, in the last few years. The recent appointment of Barbara Soutar (now Barbara Macritchie following her recent marriage) as full time Estate Conservation Officer has been a positive step in this respect. She has a particular interest in the Odonata and has also helped with moth trapping on the estate. She is also actively involved with the surveying and eradication of invasive species. The Seasonal Ranger at Kintail, Rule Anderson, has been very active with the British Trust for Ornithology's new atlas in the mountains of Kintail and West Affric and has found breeding dotterel and snow bunting. He is also carrying out bird surveys of several exclosures where regeneration of native woodland is being encouraged.



Looking NE from An-Dubh Aird, NTS - © the author

Dr James Merryweather now resides in Lochalsh, and his expertise in ferns and seashore ecology is adding considerable knowledge of these subjects in the local context. He is a former editor of *The Pteridologist* and is the author of the FSC publications *The Fern Guide* and *A Key to Common Ferns*.

Roger Cottis is the local mammal recorder based at Isleornsay on Skye, and he has carried out studies of otters and badgers in Lochalsh and has also located populations of water vole on the mainland. Roger welcomes regular counts or casual sightings of mammals.

Ishbel Cameron became actively involved with moth trapping in 2004 and has recorded an impressive number of species in the Drumbuie area. Dr Iain Matheson has resurrected his former interest in the lepidoptera and has started moth trapping in his garden in Plockton.

Both the Highland Council Countryside Rangers and the National Trust for Scotland Rangers run clubs for young children as well as guided walks for all abilities. They do a great job in promoting an interest in the countryside and its wildlife.

There is no biological records centre as such within the Highlands. The HBRG coordinate recording and Murdo MacDonald has now set up an impressive database which he

operates as webmaster. Most verified records are passed to the National Biodiversity Network Gateway except for some of the major groups, such as birds and vascular plants, which are forwarded to the Highland Bird Recorder and Botanical Society of the British Isles respectively. Lepidoptera recording is in a transitional stage with the new National Macro-moth Recording Scheme underway. HBRG is still forwarding any lepidoptera records it receives to the NBN Gateway. However the network of VC moth recorders are submitting macro-moth records to the new Butterfly Conservation scheme. Eventually it should all come together on the NBN Gateway. See the HBRG website for clarification of how to submit records of sightings in Highland (www.hbrg.org.uk).

WHAT IS SPECIAL?

So what is special about Lochalsh in the context of biological recording? Much of the flora and fauna is typical of the north-west Highlands in general but no less special for that. The flower meadows on the Drumbuie croftland have fine displays of northern marsh orchid, small white orchid and lesser butterfly orchid; the uplands have purple saxifrage, yellow saxifrage, starry saxifrage and Alpine lady's-mantle. In between one can find early purple orchid, fragrant orchid, melancholy thistle and grass of Parnassus.

Otters can be found all round the coast. Unlike inland otters they are diurnal and especially during the winter months they are readily seen. Harbour porpoises are present throughout the year and on calm days they can usually be spotted in the sea lochs. They are frequent as far 'inland' as the head of Loch Duich. Dolphins are less frequent in the sea lochs but bottlenosed and common dolphins appear occasionally. Common seals are numerous in the sea lochs and around the more open coastline where they haul out on favourite rocky islands and skerries. Seal-spotting boats sail out of Kyle and Plockton and are popular with tourists and locals alike. Grey seals are far less conspicuous in the sea lochs.



Pine Marten (left) and Black Guillemot (right) ©AMS

The pine marten is common and generates mixed feelings amongst the human population. Some feed them on a daily basis when they become quite tame and will enter houses. Others hate them due to their predatory nature and worry about their impact on chickens, cats and garden birds. The badger is also widespread and occurs even in atypical habitat on remote moorland. The less popular mink is also present in the area and its population is being monitored to assess its effect on other wildlife.

Both red-throated and black-throated divers breed while the great northern diver is a common winter visitor. In spring it is often possible to see all three divers in their splendid breeding

plumage on the same day. There is a good population of golden eagles which despite the low density of prey species appears to be holding up. Golden plover and ring ouzel numbers, however, are causing concern, both species having decreased on the lower hills in recent years, although they appear to be maintaining a presence on the high tops. Little seems to have changed in the local habitat so the problem may be on their wintering grounds. Greenshank on the other hand seem to be thriving and now outnumber golden plover. Black guillemots breed on many of the small islands scattered around the coast, as do common and Arctic terns in typically fluctuating numbers from year to year. Cuckoos and willow warblers, whose numbers are causing concern in the south, are still plentiful, and the willow warbler competes with the chaffinch as the most numerous bird in most of the tetrads surveyed for the new atlas.



Pearl-bordered Fritillary (left) - Scotch Argus (right) © the author

Although the number of butterfly species recorded is very low at 21 these include northern specialities such as Scotch argus and large heath. The Scotch argus is the dominant species during August when the numbers are extremely high, as many as 97 being recorded on my one kilometre long transect on 3 August 2006. The fritillary species are well represented with one site containing a steady population of pearl-bordered fritillary. Both small pearl-bordered and dark green fritillary are common and widespread. Grayling has been recorded but is rather elusive. The amazing northwards spread of the peacock cannot have been any more dramatic elsewhere than it has been in Lochalsh. From single records in 2003 and 2005 my own sightings jumped from four in 2006 to seven in 2007, to 21 in 2008 and to 31 (up to the end of August) in 2009. Maximum counts have gone up from seven on 9 September 2008 to 23 on 22 August 2009. It is already one of the commonest butterflies in Lochalsh. Green-veined white, speckled wood, meadow brown and small heath are the other common butterflies. Green hairstreak and common blue are widespread but less numerous.

Nationally scarce moths include yellow-ringed carpet, chestnut-coloured carpet, argent and sable, barred carpet, Manchester treble-bar, bordered grey, Scotch annulet, narrow-bordered bee hawk-moth, plain clay, square-spotted clay, great brocade, angle-striped sallow, Saxon and northern arches. The broad-bordered white underwing, a Red Data Book species, was recorded in good numbers by Paul Wheeler on a hillside near Killilan in May 2001.

The bordered grey is particularly interesting being well outside its previously known range. It has been recorded three times in three different years in the Drumbuie area by Ishbel Cameron and her daughter Charlene. It occurs on

Canna and Rum, but the nearest site on the mainland is in Ardnamurchan.

Carr Brae, Dornie, is the most northerly site of the square-spotted clay. On the strength of one sighting of an adult in 2000 a search was made for the caterpillar on 22 March 2004 by Tom Prescott and Robin Field. Amazingly two larvae were found, the first confirmed record of breeding in Scotland. Adult moths were recorded again in 2006 and 2007, including one at a new site at Inverinate.



Square-spotted Clay © the author

Several other moths have been recorded north of their previously known distribution. These include v-pug, scorched wing and clouded silver. There are still no records of the first two species north of Lochalsh, but the clouded silver has recently been found in the Ullapool area, suggesting a dramatic extension of its range. In July 2006 Dr Julian Clarke recorded red-necked footman on the Ratagan Pass a long way north of its known distribution.



Yellow-ringed Carpet © the author and (right) Scorched Wing © Roy Leverton

Loch Achaidh na h-Inich is well known for its dragonflies and damselflies. Some 11 species have been recorded there including northern emerald and white-faced darter. The golden-ringed dragonfly is probably the most conspicuous and widespread species in Lochalsh, while common hawker, four-spotted chaser, common blue and large red damselflies are also common throughout the area. The other recorded species are highland darter, black darter and blue-tailed damselfly.

One aspect, which has been studied in detail but which is mostly inaccessible to most of us, is the marine life within the three sea lochs Loch Alsh, Loch Duich and Loch Long. Sue Scott, a marine biologist based at North Strone, has dived and photographed extensively in these deep fjordic lochs and has found an exceptional variety of creatures in the different layers of fresh, brackish, and salt water. The basins in Loch Duich and Loch Alsh are over 100 metres deep but are separated from each other and from the open sea by shallow sills only 10 or 15 metres deep. These reefs have been designated as Special Areas of Conservation because of their importance for marine life, but ideally the basins should also be protected from the devastation to the sea bed caused by trawlers. It is impossible to go into detail here, but amongst the marine creatures identified by Sue are fireworks anemone, sealoch anemone, seapen, seasquirt, peacock worm, common sunstar and brittlestar.

In Great Britain the bladderless form of egg (or knotted) wrack grows only in the sea lochs of Scotland, and it can be found in many sheltered locations around the coast of Lochalsh. The unattached seaweeds look like rounded wigs and usually occur in loose groups on flat areas of the shore.



Loch Long from Ben Killilan © the author

THE FUTURE

The ringlet butterfly is the only species that seems likely to spread into Lochalsh in the foreseeable future, but no doubt a few new moths will also arrive. Whether the little egret will continue its formidable range expansion into more upland habitats remains to be seen. Osprey and red kite are still rare visitors, and it may be that there is insufficient suitable prey for these species to establish themselves here.

Despite the recent improvement in recording there are still very few people involved. Although several primary school children have become interested in moths and butterflies there is no guarantee that this interest will remain intact as they get older. As in many parts of the country there is a shortage of younger people getting involved in recording. It may be that the professional biologists, employed by governmental bodies and wildlife charitable organisations, have to play a larger role in recording in the future if the number of amateur recorders continues to decline.

Recording Marine Molluscs

By William Penrice

In biological recording terms, seashells are most unusual, in spite of the fact that they are immensely popular, children love them, and almost everyone will have picked one up at some time. Basic guides are easily obtainable, no special equipment is needed to start identifying them, and they can be kept in collections with no preparation.

However, as is so often the case, this popularity, does not translate into more serious interest. It is perhaps astonishing that they are not more widely recorded by naturalists. They may represent a real opportunity for records centres and others looking for an opportunity to stimulate wider interest in biological recording. In fact for the naturalist looking for an interesting new challenge marine molluscs are well worth a thought. There are enough of them to maintain interest,

but not so many that they become too daunting, and there is plenty of scope for those who like a real puzzler on a wet winter's evening.

To get started, an inexpensive, general seashore identification guide will get you up and running, particularly with larger shells. You can also download, for free, the Field Studies Council key to *Rocky Shore Snails* by J.H. Crothers (2003). This really is a biological recording gem, and I cannot recommend it enough. As well as a key (which could be a benchmark for others) it gives fascinating insights into the biology and study of rocky shore snails. You can get this from the Conchological Society website (www.conchsoc.org). In the Society we are rightly proud of the website, and you will find everything you need to get going, from an encyclopaedia of molluscs, recording tips, information on conservation, to equipment suppliers and, of course, a bibliography. Anyone can access all of this and it is not restricted to marine molluscs.

The Conchological Society has a long history of recording and manages both the marine and non-marine recording schemes. Records are now available on the National Biodiversity Network website. In fact, as this newsletter is published the society will be meeting on Skye to record some of the fascinating fauna visible on the extreme low tides. We will let you know how we get on. The Scottish fauna is intriguing. On our shores you can easily find typically warm water species mingling with those from colder climes. Of course the marine fauna not only includes familiar gastropods and bivalves, but also coat-of-mail shells (Chitons), sea slugs, octopus and squid.



Typical shell sand in situ in the south of Mull, 2008. Many species can be seen and this sample later yielded over 50 species under close inspection. Visible species include *Rissoa parva*, *Cingulla cingullus* and *Onoba semicostata*. © the author

Activity can range from examining the washed up shells on the strandline to attempts to find the whole range of species on a typical shore. Many are quite small, typically 2-3mm, and you will need at least a x10 hand-lens for these. A small stereo microscope is advised for more difficult species groups. Animals can be found on stones, in weed, or collected from shell sand, often in extraordinary numbers. You can expect to find anywhere between ten and a hundred mollusc species on any given seashore, with west coasts being more diverse than those in the east.

The budding conchologist can keep dead shells for reference purposes, and it is amazing how useful such a home reference collection can be in a tight identification-spot. Of course, dead shells do not raise the ethical issues as those found in many other groups, and setting up and maintaining a basic collection requires no specialist effort.

If you do become interested, join the Conchological Society, this is a friendly, helpful group of people, and you will receive newsletters, a scientific journal and the opportunity to come along to a range of field trips which occasionally take place in Scotland.



A typical west coast location in the south-west of Mull. With beautiful scenery, quiet beaches and fantastic molluscs, it just does not get any better for the conchologist. © the author

Along with the Conchological Society website at (www.conchsoc.org) there are a few other websites you might like to look at, as this is obviously not exhaustive, and a search will reveal others -

www.scottishnudibranchs.co.uk is a fantastic guide to Scottish sea slugs. Have a look even if you do not want to record them, they are amazing.

www.marlin.ac.uk is the Marine Life Information Network which gives further information on UK marine species (not just molluscs) and is worth a look.

www.fredandsarah.plus.com/ukseashells is a delightful treasure trove of information about Scottish shells, and the Isle of Eigg in particular, including good quality photographs of most of the Scottish species you will encounter.



Nassarius reticulatus, Lendalfoot Ayrshire, 21/4/09 © the author

What Eats What?

By Gordon Corbet

In promoting the concept of biodiversity much is often made of food-chains and the 'web of life' – the idea that any one species is linked to many others in an intricate network of ecological relationships. But all too often the information available on the flora and fauna of a particular site of interest consists of a bare list of names, perhaps with dates when some species were recorded and the number seen or an assessment of abundance. In documenting my 'local patch', the Scottish Wildlife Trust reserve at Dumbarrie Links on the south coast of Fife – a mere seven hectares of dune grassland – I have tried to annotate the inventory of species with some ecological relationships, initially drawn from external sources, for example by adding the normal food plant of an animal. These are mostly in square brackets, indicating that the link has not been confirmed at the site: 'Dark green fritillary, 2-3 most years, adults on flowers of common and greater knapweed [larvae on violets]'. In some groups of insects, e.g. the hoverflies, a large proportion of records are from flowers, providing links in the web, but perhaps tenuous ones since it can take painstaking observation to determine what the insect is actually doing on the flower – feeding on or collecting pollen or nectar or both, or just having a rest. Nevertheless it is a potential pollinator. Even without controlled sampling some interesting results soon emerge: 41 species of insects recorded on hogweed flowerheads so far (plus many unidentified), and 43 on dandelion, but none on cowslip, which is abundant on the reserve.

Confirming the links between herbivorous larvae and their food plants is less easy, although ecologically more important. Some are obvious, like the stripy caterpillars of cinnabar moth on ragwort and the spiky black caterpillars of peacock butterfly crowded on stems of nettles. Others can be actively searched for, for example by identifying or rearing caterpillars observed feeding on a known plant. Some of the caterpillars may produce parasitic wasps instead of the expected moths or butterflies. These may be identifiable, but it helps if the identity of the caterpillar is known – there are many thousands of species of parasitic wasps in Britain and Ireland, including about 3,200 in the family Ichneumonidae alone.

Some links are established by serendipity -- a swallow that swooped low to pluck out of the air a yellow shell moth that had just taken flight in front of me; a crab spider found carrying a centipede, both fortunately adult and identifiable – a case of predator eats predator. Links in the food chain involving vertebrates can also be established. The Mammal Society publishes guides to the identification of small mammals in raptor pellets, prey remains in otter spraints, and arthropod fragments in bat droppings (for details see www.mammal.org.uk). In these cases it is, of course, advisable to consider the possibility that the predator might have travelled some distance between eating its prey and producing the evidence.

Galls usually provide a clear link between the host plant and the animal (or fungus) inducing the gall. They can also produce several links in a chain: the common marble gall on oak usually contains not only the larva of the wasp that induced the gall, but the larvae of 'inquilines' that are sharing the gall without having caused it, and both of these are liable to be parasitised

by yet smaller wasps. Many microfungi are parasitic on living plants, some of them conspicuous and fairly host-specific, like the bright yellow rusts on nettles and meadowsweet. All parasites provide very intimate links, and for most species are normal associates rather than pathological exceptions, but there are pitfalls. Fleas found in the ears of a freshly dead rabbit are clearly parasites, but the mites commonly found on burying beetles are just passengers, in spite of belonging to the family Parasitidae (none of which appear to be parasites). The mites are just hitching a lift to a corpse where they dismount to prey upon the eggs and larvae of the flies that have got there first, clearing the way for the beetle larvae that will eventually feed on the corpse.

In promoting the conservation of biodiversity to planners, politicians and the general public, demonstrating the complexity of the web seems more important than listing names, but how to do it? And how practical is it to enter such links into the databases of record centres? The number of potential links soon becomes rather astronomical. With around 1600 species on the Dumbarrie Links inventory so far, including about 210 vascular plants and a thousand insects, the number of potential links is mind-boggling, but looking for them adds a lot of interest to recording, and it can be very satisfying removing those square brackets. (But I still have not been able to remove the square brackets from the caterpillars of dark green fritillary feeding on violets in spite of an abundance of violets on the reserve.)

Found!- the rare Puffball *Lycoperdon caudatum*

By Roy Watling

On a very wet day a bundle of 15 brave souls assembled at Carrifran to look at the fungi, which may have started to appear in the newly planted tree-project there. Over 40 species were found, mostly microscopic forms, the rank grass amongst the trees apparently inhibiting a good showing of large fruit bodies. However, along the track-side an unfamiliar puffball was collected. It was immediately recognized as different and unlike the common jewelled puffball, *Lycoperdon perlatum*, which might have been expected. Here the scales on the outside were easily removed, almost as a single skin, and left no characteristic pits and spots, which is the tell-tale characteristic of *L. perlatum*. Thus one specimen had partially lost its scales, making it resemble a friar's bald head with a ring of white fluffy scales around the margin.

The fungus under the microscope was easily identified, as the basidiospores had a long tail more than 5 times the diameter of the spore; generally puffball spores have a short stubby appendage. This immediately identified it as *L. caudatum*, an earlier name for the more appropriate epithet 'pedicellatum'.

This is a rare southern Scottish fungus and was thought to be extinct until Reid and Dring recorded it from Dunbartonshire in 1964. However in the Edinburgh herbarium there is an unlocalised collection dating to 1821 or thereabouts from R.K. Greville, probably collected about Edinburgh or even

Fife. The fungus is reported to be found in calcareous sand dunes or damp calcareous woodlands, neither of which is appropriate to the Carrifran collection, although damp as it was that day.

Our collection was at the edge of the track close to planted *Betula* and *Corylus*, whips of which were locally sourced. Whether it came with the whips or perchance on its spores on the wind - and liked the site - we will probably never know.

BRISC Projects

Bursaries:

Back in March 2009 BRISC and Glasgow Natural History Society each offered 2 bursaries of £150 to anyone aged 18-30 and living in Scotland towards attending a course offered by the Field Studies Council. The successful applicants were asked to write a short piece for *BRISC Recorder News*, so read below here about Kim McEwan's experience on her chosen course.

Please also note that it is planned to offer similar bursaries for 2010, this time with no age limit. Application form will be posted on BRISC and GNHS websites, so watch this space. Ed.

Dragonfly & Damselfly Identification FSC Kindrogan 17–19 June 2009

By Kim McEwan

Thanks to the bursary from BRISC I was able to attend a dragonfly and damselfly identification course at the Kindrogan Field Study Centre in Perthshire.

The course, expertly run by Jonathan Willet, focused on the eleven common species of dragonfly and damselfly found in Scotland. The mornings were spent in the classroom learning how to tell the different species apart in both their adult and larval stages, with the afternoons spent splashing in and around ponds trying to identify the insects in the field. We found many of the common species on our field trips and were extremely lucky to come across a small pond, not far from the field centre, to find dozens of large red damselflies in various stages of emergence.

I picked this course so I could begin recording these insects on Cathkin Marsh Wildlife Reserve, south-east of Glasgow, which is the wildlife reserve at that I manage. Previously, I had found the identification of these insects, particularly the blue damsels, rather impossible. However, after completing the course I have had no problems identifying the different species and could not wait to begin recording on the reserve, particularly as there were no records within the 10km square which the reserve is located in. I have already begun submitting records of damselflies, of which we have all of the five common species. I also hope to run a public event at the reserve to try and encourage more people to record these insects, as the identification course has given me both the skills and confidence to do this.

I cannot recommend this course highly enough for anyone interested in learning more about these fascinating insects, and I would like to say a huge thank you to BRISC for giving me the opportunity to attend the course.

E-Petition

The E-Petition was re-considered by the Scottish Parliament Public Petitions Committee on the 8 September. Nigel Don, MSP, commented that the current financial climate would make finding funding to address the issues raised in the petition difficult. Robin Harper, MSP, emphasised the role of the voluntary sector and urged that pressure should be applied to local authorities to ensure that they recognise their responsibility to base their planning decisions on up-to-date biological data. The Committee agreed to keep the petition open and further pursue the issues raised. In addition, BRISC is shortly to be asked to provide evidence to the Scottish Biodiversity Strategy Science Group.

Craig Macadam

BOOK REVIEWS

Tittensor, R. (2009). *From Peat Bog to Conifer Forest; an oral history of Whitelee, its community and landscape*. Packard Publishing Limited, Chichester. 237 pp. ISBN 978 185341 142 7. Sbk £27.50.

This book is about the creation of a forest centred on some upland moors at the junction of the counties of Renfrewshire, Ayrshire and Lanarkshire. It describes the changes from farming before the land was acquired, how it was drained, fenced and planted, to its use today for harvesting timber, informal recreation, and a wind farm. It describes the soils, lochs and burns, the awful weather, fauna and flora, collecting gulls' eggs, controlling pests, digging peats, tree planting and tree felling. There are tables summarising changing land-uses with afforestation. The several appendices include a photographic portrait album of the 56 contributors, the scientific names of flora and fauna, a glossary of Scots and English words, a list of the 211 illustrations and an index.

Every bit as important, this book tells about the families who once farmed the land and what they thought about the changes in land use, about the many skills needed to do the work, and about the people who then and now enjoyed the area for reasons other than its conversion from peat bog to conifer forest. So this book is both a history of a particular kind of land use and a social history, and in this context it is an important contribution to the way certain changes have happened in Scotland in the second half of the 20th Century. For older generations of explorers, it is also an evocative record of how things used to be: poignant memories of trudging through miles of young growth forests in the 1950s and '60s; of struggling across land deep-scored with a Cuthbertson plough, or scrambling on all fours under the Stygian darkness of an unbrushed closed canopy, only to find oneself emerging at an eight foot fence. The once familiar sight of fire brooms is mostly gone; without the fire hazard of knee-high grass their need has waned and today a different culture holds: that fire is for the fire service to put out, not the forest squads who are not there anyway.

For readers both old and young Ruth Tittensor has done a magnificent service in putting on record an important story about changing Scotland and about a huge cast of players.

The background essays on, for example, peat formation, hill farming, forest workers' holdings and management staff are masterful summaries of complicated subjects. The numerous colour photographs and their captions are top-notch; and the maps and layout all excellent. The publisher also deserves warm congratulations for his several contributions, not least his seminal decision to publish this story of a forgotten bit of dour countryside.

Much to my regret, however, I have one major reservation. Ruth's book is the result of the Whitelee Forest Oral History Project, and it so happens that a few months ago I read another recently published book dealing with land use history, also in large part based on recorded interviews with local people¹. But whereas the author of this other book decided to edit the transcripts so as to remove repetitions, hesitations and Scottish pronunciation (while of course checking with contributors that they approved the edited transcripts) Ruth and her colleagues have gone to great lengths to retain every nuance of the spoken word and she writes: "*transcribers do their work without imposing grammar on what was a freely-spoken discussion – it is the only way to present verbal discussion accurately as writing. I hope you find the result is more personal, more colourful, has more feeling and gives more points of view than you would get from my personal interpretation of what was said.*" Alas, I have to disagree and, while not questioning the absolute integrity of both authors to wish to communicate their respective histories as a true interpretation of what was said, I found Mary Young's edited oral transcriptions much easier to read than the strictly accurate verbatim speech of the Whitelee book, despite having lived in Scotland amongst country folk for over half a century. Indeed, even my Scottish neighbour had difficulty in reading to her father (who worked in forests much of his long life) the passage about the adder: "*If ye got a real dry kinnae bit, or part o it wis sittin high – kinnae hag bit sittin high – eh, ye'd tae be careful where ye put your foot on it on a really hot day because there were, there were, there were adders on it as well*" (p. 36). But perhaps the methodology of oral history is a minefield of debate and even a reviewer should leave well alone.

Another tricky but related subject is forest policy. In my opinion there are few more contentious subjects for debate than why post-war governments – and thereby the Forestry Commission - decided to cover so much of Scotland with Sitka spruce, including the forests at Whitelee. Even this sentence is contentious because it suggests that there could be different 'takes' on history and that there might be different, yet equally respectable, approaches to weighing up the rights and wrongs of past actions. My judgement is that although Ruth Tittensor has provided a pretty well-balanced account from the recorded interviews with former players, readers should be aware of her decision that "The book is written entirely from the orally derived material of this project, or from participants' written contributions. Documentary sources from the Forestry Commission or elsewhere have not been used to provide information; printed sources have been used sparingly, only where a context is needed."(p.9) One can see where this

¹ Young, M. (2008). *Abernyte, the quiet revolution*. Perth & Kinross Libraries & Lifelong Learning. ISBN 978-0-905452-55-5. Sbk £12.

decision is coming from so as to keep the Oral History Project free of any published 'spin', but from where I look back, I should be unhappy if the history of any of the Quangos I worked for were to rely on oral reportage without also making use of written sources.

This is an excellent and welcome book which can be ordered from bookshops to save over £4 postage and packing charge from the publisher.

Thomas Huxley

Smout, T.C. (2009). *Exploring Environmental History: Selected Essays*. Edinburgh University Press. ISBN 978-0-7486-3513-9. Hbk £60.

The modest title of this book gives little idea of the excitements that lie within. The essays were originally given as lectures, but have been expanded and revised over the years and, as one would expect from an author who kept generations of students awake and interested through his lectures, there is not a dull page among them. Since reading the essays, points that were made in them keep bubbling up in my mind: questions about landscape and culture, the sustainability of forms of landuse in the Highlands, and the systems that enabled this until demographic increase tipped the balance into debit. There is a fascinating observation in the essay on Scotland, Ireland and Iceland, 1600-1800 on the inefficiency energy-wise of the new houses in Edinburgh. The thought of the gracious Georgian houses as monuments to conspicuous consumption, thanks to the abundance of cheap coal, is a disturbing one. Elsewhere in that essay we learn of the extraordinary hardships undergone by generations of Icelanders in their (as it was at the time) energy-poor country.

The subject of the woodland history of Scotland is covered in three essays, each of which focuses on an aspect of the subject – their exploitation, pinewoods and human use, 1600 to 1900, and the Atlantic oakwoods as a commercial crop in the eighteenth and nineteenth centuries. Oliver Rackham showed how use and need preserved woodland resources in England, rather than destroying them, a novel idea in the 1970s. Chris Smout has done a similar service to woodland history in Scotland by his rigorous research and the work that has followed since.

The closing remarks of the essay entitled 'The Pinewoods and Human Use, 1600-1900' cast an environmental historian's insight on the apparently high rate of failure of New Native Pinewood Schemes outside the main strongholds of the species in Speyside and Deeside. Smout's thought is intriguing, but I wonder what the criteria for failure were. If he is going by the Forestry Commission's criteria, for example: not enough trees per hectare and insufficient growth, I feel that these standards were too narrowly set. Seen through the eyes of an ecologist rather than a forester it might be thought that some of these young plantations were a success, providing habitat for black grouse and setting the stage for a later and more abundant regeneration of woodland.

Smout's observations on the extent of the oakwoods in 'The Atlantic Oakwoods as a Commercial Crop...' (and indeed

the pinewoods in the previous essay), and the questions that he raises on possible changes in biodiversity, are fascinating. The extraordinary commercial single-mindedness that excluded all but the chosen species speaks of a sorry blindness to the diversity of nature and suggests a prolonged impoverishment.

'History, Nature and Culture in British Nature Conservation' is an essay in which Chris Smout pulls no punches. 'Some rewilders...Once they have convinced themselves of an original-natural state, typically based on a popular myth...' As a rewilder in my heart this essay is the one that most challenged me. I live in a heavily designed and managed landscape and yet I want to rewild every corner that I can: beavers to the running waters, lochans and wetlands. And as for the uplands: to think that the moorlands managed for grouse are the heirs of Neolithic practices of land-use and thus have a certain legitimacy! I believe that we should leave the forest to roll in and on up the slopes to carpet the hillsides with birch and its successors and to create a mosaic of forest in those places where it can. Gardening has a place in the enclosed landscape, but unless corridors for wildlife can be established or retained does this not give rise to the kind of blobby island landscape that leads to the extinction of species and the impoverishment of biodiversity? Where now are the wetlands near Coupar Angus for cranes to breed in and for dotterels to pass through on their way to breed on the high tops of the Cairngorms? Should we not be rewilding flood plains for this purpose? As you can see this essay plunged me into turmoil because, although I agree with much that Christopher Smout says about the role of the historian in landscape ecology and the value of the cultural landscape, I find myself back with the opinion that Mencius expressed in his famous 'Ox Mountain' parable. See

http://books.google.com/books?id=blVWjFIsPD8C&pg=PA21&lpg=PA21&dq=ox+mountain+mencius&source=bl&ots=CZMDnM5Ds9&sig=VNJzk2agenxBOPL2jv9zf8FicJc&hl=en&ei=o6S0SueuEYLQ-Qbwm8DrCQ&sa=X&oi=book_result&ct=result&resnum=5 - v=onepage&q=ox mountain mencius&f=fal

This is a memorable book, rich in scholarship and full of argument, and elegantly written, in which recent political controversies rub shoulders with ancient practices of animal husbandry. I have not mentioned the splendid essay on alien species, or the excellent one on British agriculture and the decline of biodiversity. Apart from some small slips (Norman Ridley turns into Nicholas Ridley a page later and surely Edmund, not Thomas Burt was the gentleman who wrote those letters from the Northern Highlands: errors that the Edinburgh University Press should have noticed) its only fault is that it costs £60, which is a lot for quite a slender volume. On the other hand the brilliance of the essays must make 'Exploring Environmental History' a thoroughly worthwhile purchase or gift.

Paul Ramsay

Gregory, S. (2009). *Woodlice and waterlice (Isopoda: Oniscoidea & Asellota) in Britain and Ireland*. FSC Publications, Shrewsbury. 175 pp. ISBN 978 0 9557672 8 9. Pb £19.50.

The core of this excellent publication on the terrestrial and fresh-water isopod crustaceans is a set of 10km distribution

maps, updating those published in 1985 (Harding & Sutton, *Woodlice in Britain and Ireland*, ITE), but like its predecessor this has much more. Each species map is accompanied by a colour photograph and one or two pages of text giving a comprehensive account of distribution, habitat, microsites, etc. The British and Irish species comprise 4 water lice, 40 woodlice in out-door habitats and 12 recorded only in glass-houses; in Scotland we have 2, 22 and 3 species in these categories. Coverage in Scotland is patchy -- some of the more elusive coastal species such as *Trichoniscoides saeroeensis*, are moderately well recorded while there are large areas, especially in the Highlands, without recent records of the common widespread species. (Recent records are from 1983-2007, i.e. since the last atlas.) It seems a pity that this was not extended to include terrestrial amphipods. We do not have any native species (apart from tideline sand-hoppers straying a few metres inland), but one alien from the southern hemisphere *Talitroides dorrieni* is well established in parts of the western highlands and islands, primarily in gardens but probably expanding.

There are extensive chapters on ecology and zoogeography, but this does not include identification keys, although each species account begins with a useful paragraph on 'distinctive features'. For identification the two most recent sources are an AIDGAP key by Hopkins (1991), and a more detailed *Synopsis of the British fauna* volume by Oliver & Meehan, (1993), both also published by the Field Studies Council. The author quotes the late Steve Hopkins as describing woodlice as 'fascinating and endearing creatures'. If you have not reached that stage, give them a try – you might come to love them and be able to fill (or confirm) some of the many gaps in the maps.

Gordon Corbet

Macdonald, D.W. (ed.) (2009). *The encyclopedia of mammals*. Oxford University Press. xli + 936 pp. ISBN 978-0-19-956799-7. Paperback, £19.99.

This global compendium on mammals is a paperback, but substantially updated, version of the second edition published in hardback in 2001, itself a remarkable undertaking. It is amazingly comprehensive, with around 250 authors, all with first-hand experience of their subjects, and a strong emphasis on ecology and behaviour. The format of the 2001 edition has been retained with slightly reduced size of page and font, but the sequence of orders is changed to reflect revised classifications, incorporating many changes resulting from the analysis of relationships by molecular techniques. Much of the text has been brought up to date and a few new topics covered by extended entries, especially in the section on primates: 'Beating diseases', 'Climbing the evolutionary tree' (human evolution) and 'Towards a more intelligent ape' (cultural evolution). It is copiously illustrated, and all 5000 or so species of mammals get a mention, if only by an entry in a list with distributions. How a three kilo paperback will stand the test of time seems uncertain, but if it does then this is quite remarkable value.

Gordon Corbet