



BRISC

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Recorder News

What's Special about Scotland's Saline Lagoons? –

Stewart Angus p.1

Update from the Scottish Biodiversity Information

Forum – Christine Johnston p.5

Bursaries p.5

• **Invertebrate Surveying Techniques –**
Michael Goldie p.6

• **Sedges and Rush ID –** Laura Cunningham p.6

Book Reviews p.8

• **Peterken, George. (2013) *Meadows*.** (RMM Crawford)

• **Watson, K. J. (2013). *The Flora of Renfrewshire*.**

(Alison Moss)

• **Love, John A. (2013). *A Saga of Sea Eagle*.** (Chris Smout)

• **Jenkins, David (ed) (2013) *Birds in Mid Deeside 1970-2012*.** (Alistair Shuttleworth)

• **Goulson, David. (2013) *A Sting in the Tale*.** (Sarah Eno)

NBN Update p.12

Dates for the Diary p.11

Chairman's Column – Jonathan Willet p.2

Editorial - Anne-Marie Smout p.2

BRISC Contact Details p.2

Copy Deadline for January 2014 Issue p.11

The water is neither fresh nor fully saline but brackish, though, unlike estuaries, the connection to the sea is restricted in some way; it might be a long, sinuous channel, a culverted stream, a hidden underwater sill, or even a trickled exchange through a bank of shingle.



Loch of Carness, Mainland, Orkney. There is a pipeline within the shingle impoundment that allows water to flow freely in and out of the lagoon. Photo by Stewart Angus. © SNH

The name of this habitat is dictated by the EC Habitats Directive, where it is given Priority Status on Annex I. The Joint Nature Conservation Committee defines saline lagoons as “areas of shallow coastal water, wholly or partially separated from the sea by sand banks, shingle or, less frequently, rocks”, effectively ending a debate over the definition that as recently as 1989 featured the contention that there were only four saline lagoons in Scotland, none of which would now be regarded as a saline lagoon.

Continued p.3

WHAT'S SPECIAL ABOUT SCOTLAND'S SALINE LAGOONS?

By Stewart Angus

At first sight, they look like any other inland lochs, until you notice there is seaweed round the edges, even though you might be some distance from the sea ... and any connection with the sea might be less than obvious. This is merely the beginning of the oddness of Scotland's saline lagoons.



Western basin of Loch Bi, South Uist, from the north end of the causeway. Photo by Stewart Angus. © SNH



Chair's column

In my last column I wished everyone a good summer for their biological recording. It certainly seemed to be so for me. June, July and to a lesser extent August were really rather good weather-wise. The berries seem to be saying so and seemingly the trees have done very well, with lots of sugar in the leaves so this should lead to a fantastic autumnal display of colour. I enjoyed one of the last days of warm sunshine at Coille Dalavil on Skye. Dragonflies were still buzzing about, Toads and Palmate Newts were on the move in the forest and I was graced with the sight of a Golden Eagle tacking across the wind, high above me.

I have been at two events over the last week where biological records have been discussed and how they could make the delivery of land management funding better focused, and thus better at delivering the outcomes required. It is no secret that the Scottish Rural Development Programme (SRDP) does not deliver for biodiversity or catchment management at the national or regional scale. Apart from the problems of its complexity, lack of regional budgets and general lack of clarity, there is no feedback mechanism to alter the priorities of the scheme when trends related to biodiversity show a different local priority needs to be delivered.

For example, the significant sheep reduction on Skye could have a major impact on biodiversity but how will the new SRDP respond to that in relation to the changes in vegetation? The consequences of this could be good, bad or neutral for biodiversity, but there is no monitoring or feedback to tell us. This may seem asking something quite onerous, but focusing on the "Ecosystem Approach" for conservation means that we need this information to monitor the health of our ecosystems and optimise publicly funded land management.

Obviously volunteer recorders cannot do all this but their records could help. I was talking to the BTO about their large dataset and how it could potentially be used to advise on land management both on a local and regional basis. Then the conversation turned to all the other species that do not have large datasets and scientific examination to determine trends and impacts of habitat change. Aside from birds there seems to be a real lack of academic use of biological records, and this seems like a major gap. Is it just that small datasets from other species preclude scientific analysis?

Maximising the use of biological data from purely presence/absence into something more would certainly make it more valuable and if this information could feed into the land management funding, and a positive feedback loop make land management priorities more responsive to the local biodiversity situation. It would also allow scientists to communicate with volunteer biological recorders about how they could collect data that would be of most use for scientific analysis. This would obviously be purely a suggestion but some "keenies" might be very interested. Gaps in the collection of scientific data could then be filled by agency staff. I am sure they would like to get out in the field.

Of course all this local information can be aggregated nationally so this would produce better national trends monitoring. It may all sound a bit pie in the sky, a phrase used more than once in this column over the years, but the lack of ambitious/ ideas from organisations regarding the use of biological data in helping to spend public money more wisely to conserve our biodiversity is quite stunning. There is a massive opportunity to be grabbed to our collective benefit. Next time I will be discussing national habitat mapping.

Focussing on the here and now, BRISC's annual conference is just round the corner on Saturday the 26 October at Newbattle Abbey College, by Dalkeith. It will be focusing on new technologies for biological recording; we will have several presentations looking at new "apps" and then the opportunity to use them in the field in the afternoon. It will be an illuminating day I am sure, plus we have the AGM and of course the raffle. See you there.

Jonathan Willet



Editorial

There is much to worry about regarding our wildlife in the countryside, such as this year's startling, near total, absence of bumblebees out at Tentsmuir NNR, where I do a monthly butterfly transect, but there is some good news elsewhere: the Short-haired Bumblebee *Bombus subterraneus*, which died out in the UK last century, has been reintroduced at Dungeness with queens from Sweden, and the first workers were seen this summer, indicating that at least some nests have been successful. It is of course too early to be sure of a lasting success, but this year's hot summer must greatly have helped. The RSPB has produced a 10 minute long film to celebrate the introduction, which was focused on their reserve, but bumblebees must not be limited to the nature reserves if they are going to be successful, so it is particularly encouraging that so many farmers and landowners in the area are being very supportive and doing their bit for the bees by creating suitable flowery habitats on their land. To see this excellent and informative film, go to <http://www.rspb.org.uk/film/74706078.aspx>

It is also a pleasure to announce that Anthony McCluskey of the Bumblebee Conservation Trust will be at BRISC's conference on Saturday 26 October and will give a short presentation on the new bumblebee app. There will also be a chance to look at the app in more detail later. Another very good reason for attending this annual event!

For bumblebee enthusiasts it should also be mentioned that the latest book *A Sting in the Tale* by bumblebee champion, scientist and founder of the Bumblebee Conservation Trust, David Goulson, is reviewed as one of five books in this issue. The four others are on meadows, the flora of Renfrewshire, birds of Deeside and the Sea Eagle, all of which will undoubtedly be of interest to many readers.

It is very timely that BRISC's conference theme is "New Technology for Biological Recording". Some of us older naturalists may be wedded to books, but the innovative and increasingly user-friendly technology which is emerging is truly astonishing, and anyone not opening their minds to this will be the poorer for it.

Many organisations like BBCT and RSPB are already taking full advantage of the many electronic ways to interact with people. It is also via this media that young people interact and react these days. The advantage is that a vast amount of interesting information can be disseminated and accessed at the click of a mouse. The Scottish Wildlife Trust is thus asking for people's support relating to the different Marine Protected Areas (MPAs), suggested by the Scottish Government and for which the Scottish Government is running a public consultation as part of a new plan for managing Scotland's seas and protect and enhance nationally important marine habitats and species. SWT is asking for public support now – which can be done on-line - to make sure these proposals become a reality. Do take a look at the webpage: www.livingseas@swt.org.uk, which gives the report, and to respond to the consultation go to http://scottishwildlifetrust.org.uk/what-we-do/living-seas/?utm_medium=email&utm_campaign=Marine%20Protected%20Areas

Anne-Marie Smout

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Continued from p.1.

Most of the work done on the UK's saline lagoons has been done in England and Wales, where there is a much wider range of species, and lagoons are almost always isolated from the sea by a bank of shingle or sand. Impoundment lagoons are frequent in Orkney and Shetland, but rare in the Outer Hebrides, where almost all are rock basins. The loch-studded terrain of the Uists is so low-lying that many of the coastal lochs, and even some lying some distance inland, are invaded by the sea on some or all tides. Almost all of Scotland's saline lagoons are in the Western and Northern Isles, but there are a few in the Inner Hebrides and scattered round the mainland coastline.



Panoramic photograph of the western basin of Loch Bi, South Uist. The loch is bisected by a causeway (barely visible on the left). The connection to the Atlantic lies beyond the right of the picture.

Photo by Stewart Angus. © SNH

No one knows exactly how many there are in Scotland, but the most recent official count is 105. They are difficult to separate from coastal fresh water lochs or saline inlets without salinity measurements, and it is highly likely that many remain undetected. The largest lagoon in the UK is the Loch of Stenness in Orkney (786.0ha), closely followed by Loch Bi in South Uist (703.5ha). The only UK lagoon outside Scotland exceeding 100ha is The Fleet, at 493.7ha. Almost all lagoons in Scotland are shallow, rarely exceeding 5m in depth, but the northern basin of Loch Obasaraigh in North Uist is exceptional in being over 45m deep.



Flap valves on the culverts under the Brig o'Brodgar in Orkney, open to allow flow from the Loch of Harray (right) to Loch of Stenness (left). Photo by Stewart Angus. © +SNH.

Some lagoons have flap valves designed to allow water to flow to the sea at low tide, but closing to prevent the sea flooding in at high tide. Most of these, if not all, leak sea water into the lagoon. In Orkney, the Brig o'Brodgar had valves installed in 1968, renewed in 1993, allowing fresh water to flow from the Loch of Harray into the Loch of Stenness, but closing to prevent brackish water from Stenness entering Harray. They were installed because a fish kill in Harray in 1967 had been blamed on saline inflow. Rightly or wrongly, the valves have been blamed for the loss of the snail *Theodoxus fluviatilis* from the Loch of Stenness (where it had not been seen since 1938), and the Loch of Harray is now its only Scottish site.

Loch Bi is unusual in being linked to the sea at both ends. The NW end of the loch once had valves on its culverts resembling those on the Brig o'Brodgar, but these were lost, allowing a free exchange of water between the loch and the sea at Iochdar. The link at the east end connects the loch to the Minch via a leaking sluice gate in an excavated channel.



Eastern floodgate and channel from eastern end of Loch Bi.

Photo by Mark Woombs. © SNH

Though Scotland's lagoons are brackish, the detailed picture is complex. All but the smallest and shallowest develop a stratified structure at least in summer, with a layer of lighter, lower salinity water floating above a layer of heavier, more saline (but brackish) water, with the two layers sharply separated at a 'halocline', which usually also has a sudden change in temperature. The depth of the halocline is usually around one metre, but it tends to occupy a shallower depth with distance from the sea. Winter rainfall in calm conditions may allow stratification to develop at least temporarily. It is thus essential to take a range of salinity measurements to cover the extent and depth of the loch, but salinity also varies with the state of the tide, so data loggers are required to gain a true picture of the situation. The lochs are microtidal, with a range of some 50cm between low and high tide, but the lowest water levels are experienced during neap tides rather than spring tides, because it is easier for water to flow into the lagoons than to flow out.

Many lagoons have marine organisms near the sea entrance, and there may also be fresh water organisms near significant inflow streams, and for many lagoons, this is as varied as it gets. The most interesting lagoons, however, support a range of species that live only in lagoons. Though the tolerance range of these species to salinity has been given a great deal of attention, the real reason these lagoon-specialists thrive in these conditions is because of their tolerance of environmental fluctuations that would cause damaging levels of stress in their saline or fresh water counterparts.



Loch an Duin, North Uist. The halocline, where lighter, less saline water, is sharply separated from denser, more saline water, is visible to divers. Photo by Sue Scott. © SNH

If measuring salinity and other aquatic parameters is a problem for the ecologist, identifying the inhabitants is possibly even more difficult, because almost all of them are small, and closely resemble their marine relatives ... or each other.

The flora includes some vascular plants, notably Tasselweed *Ruppia maritima*, which can form extensive beds, along with Eelgrass *Zostera marina*. However the brackish specialist Spiral Tasselweed *Ruppia cirrhosa* can be reliably separated from its more widespread relative only in late summer.

The lower plants include a range of stoneworts, some of which are protected by law. Because they are difficult to identify, anyone sampling this group needs a licence from Scottish Natural Heritage. The Bird's Nest Stonewort *Tolypella nidifica* is now confined in the UK to two lagoons in North Uist, the same two sites occupied by the rare Baltic Stonewort *Chara baltica*, while the Foxtail Stonewort *Lamprothamnium papulosum* has some 15 sites, all in the Uists, with a further four sites in southern England. *Chara canescens* is often listed as a brackish species, but in the UK is confined to a group of fresh water lochs and pools on the island of Baile Sear in North Uist and some pools at an old brickworks in Peterborough.



Young cockles attached to rock by byssus at the east (landward) end of Oban a'Chlachain. Animals this young cannot be identified to species with certainty, but the only cockle recorded from this loch is the Lagoon Cockle *Cerastoderma glaucum*. © SNH

The best represented animal group in saline lagoons is the Crustacea, with a range of mysid shrimps and isopods. The main mysid is *Neomysis integer*, which can occur in huge

shoals, but other species occur and careful checking is required. Until last year, the only Scottish record of the isopod *Lekanesphaera hookeri* was from Loch Bi, but a survey for Scottish Natural Heritage carried out by the National Museums of Scotland found it in most of the lagoons they examined in the Uists. Their work on the isopod *Idotea* provides a cautionary tale. It is generally accepted that the only species of this group found in lagoons is *Idotea chelipes*, but there had been reports of *Idotea baltica* in Loch Bi. This rather suggested that the loss of the floodgates from the NW end of Loch Bi had let so much sea water into the lagoon that marine organisms were able to thrive. When I joined the Museum staff on their survey of Loch Bi, we found both species side by side, but careful checking in the Museum confirmed that all of them were *Idotea chelipes*, despite some exhibiting clear characteristics of *I. baltica* as described and illustrated in the standard key.



Loch an Duin, North Uist. The ultimate lagoon image? Lagoon Cockle *Cerastoderma glaucum*, flanked by Bird's-nest Stonewort *Tolypella nidifica*. Picture by Sue Scott. © SNH

The Lagoon Cockle *Cerastoderma glaucum* is slightly more turgid than its common counterpart, and a pin lain across the top of the shell touches in two places, as opposed to one in *Cerastoderma edule*. The adult lagoon cockles tend to lie half-buried in sand, but younger animals often attach themselves to stones and vegetation. The only confirmed records are from the Uists and the lagoons around Loch Sween – all other Scottish records are currently regarded as unreliable. The gastropods are dominated by a lagoon form of the Rough Winkle *Littorina saxatilis 'tenebrosa'* (not a valid taxon) and the mud snails Hydrobiidae. The fresh water *Potamopyrgus antipodarum* occurs in lower salinities, replaced by *Ecrobia ventrosa* then *Hydrobia acuta neglecta* then *Peringia ulvae* as the salinity increases. Reliable identification relies on close examination of the antennae, though examination of the penis is also useful ... bearing in mind that the whole animal is rarely bigger than 4-5mm. The National Museum of Scotland has used DNA to confirm species identity in this group in the Uists.

Current knowledge suggests that the most diverse lagoons are in the Uists, followed by those around Loch Sween, with those of the Northern Isles, mainland and Inner Hebrides some way behind. Within the Uists, the richest sites are Loch an Duin and Loch an t-Sruith Mhoir in North Uist and Loch Bi in South Uist.

Monitoring of lagoons is beset with problems. Salinity and temperature vary with time, depth and distance from the sea. Not only are the organisms very difficult to identify reliably, but they seem to disappear from sites, only to re-appear

later. It is not yet known why or how these organisms move around, but the mudsnails can float on the surface tension and drift in the wind, while others are believed to take advantage of drifting vegetation rafts to change position.

Scottish saline lagoons are regarded as relatively safe from contemporary adverse impacts. Agricultural run-off is believed to be damaging to stoneworts, and there are some highly localised reports of pollution, but that is all. The most significant impact on the habitat is climate change: the Uists and Orkney are in the parts of Scotland most affected by relative sea level rise, recently recorded as around 6mm per year. As sea level rises, it will gradually increase the salinity of lagoons, eventually capturing them as saline inlets. Though the lagoon organisms might be able to tolerate these higher salinities, the consistently higher salinity will give a competitive advantage to their marine counterparts. The rock basin lagoons are vulnerable to sea level rise, but the shingle-impounded lagoons of the Northern Isles are additionally vulnerable to breakdown of the sediment barrier and thus the destruction of the lagoon, though this will be balanced by the creation of new lagoons through the redistribution of sediment in the wider coastline.



Oban a'Chlachain, North Uist, looking west towards the sea. Photo by Stewart Angus. © SNH

The loss of saline lagoons to marine inlets will be offset by the capture of lochs that are currently fresh water – the Western and Northern Isles contain an ample supply of coastal lochs that would become lagoons with sea level rise. Though the habitat is more than capable of ‘roll back’, the same might not be true of the inhabitants. Some of these species are rare because they have limited dispersal powers: will they be able to make the transfer to their analogue sites as sea level transforms their current sites to fully marine conditions? How much intervention, in the form of habitat management and/or species translocations, is acceptable on nature conservation grounds?

Most of the lagoons have retained their current conservation interest despite a history of intervention by drainage, causeway construction and management of the sea exchange. That they have been robust in the past is not a guarantee that they will be robust in the future: we do not yet know enough about the functionality of these systems or the requirements of their inhabitants. Improving this knowledge base is essential if we are to safeguard this intriguing habitat and its species for the future.



Moorings for SNH data loggers in Loch an t-Sruith Mhoir, North Uist. Photo by Stewart Angus. © SNH

BRISC Projects Report

Update from the Scottish Biodiversity Information Forum (SBIF)

By Christine Johnston

Since the last edition of *Recorder News*, the SBIF Action Plan has been agreed by the Steering Group and details are now due to be published on our web pages in October. In summary the Plan contains seven actions:

- Action 1: Finalise the SBIF Vision
- Action 2: Pilot a model data pathway
- Action 3: Survey the data needs of the SBIF community and consider the information
- Action 4: Prepare and promote statements of best practice on data sharing
- Action 5: Produce and promote standardised data collection and sharing protocol
- Action 6: Compile and disseminate case studies that illustrate good practice and the value of data gathering and sharing for conservation and management in Scotland
- Action 7: Encourage LRCs to carry out a gap analysis on their data holdings and to identify if data available through the NBN Gateway can fill the gaps

Action 1 is now complete; the Steering Group approved the following vision statement at the end of July:

High quality species and habitat data will be collected and managed through a sustainable, co-ordinated and integrated local and national framework of organisations, partnerships and initiatives. These data will be available to ensure that Scotland's biodiversity, ecosystems and people benefit.

This vision statement will help guide the work of the Forum and the development of the actions. In order to take the rest of the actions forward, the SBIF Data Flows & Data Sharing Sub-group will be meeting on 1 October to discuss the development and delivery of Actions 2, 6 and 7, and the Commercial Interests Sub-group will shortly be convening a meeting to discuss Actions 4 and 5. Each of the sub-group meetings is attended by SBIF supporters who have expressed commitment to the work of the SBIF, and successful delivery of the actions will be dependent of continued support from the sub-groups.

It is indeed exciting times for the Forum now to have an Action Plan, and I am looking forward to this next phase in the SBIF's work. I am also looking forward to this year's BRISC AGM, which is being held at Newbattle Abbey College near Dalkeith. Its focus on new technology is extremely timely as the biodiversity community can only benefit from opportunities like this to discuss and get hands-on with technology that affects us all.

If you would like to get involved with the Forum, or to be kept informed of SBIF's activities, my contact details are:

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Bursaries

This is an extremely worthwhile project initiated by BRISC and generously supported by Glasgow Natural History Society. In fact, so successful that GNHS has agreed to offer further two bursaries for 2014, making four in all. In addition, our anonymous donor will yet again provide £200 for a bursary, which means that for 2014 GNHS BRISC will have seven bursaries to allocate. The invitation of apply will appear on our websites early January 2014, and the conditions and selection criteria will be more or less the same as this year. The successful applicants will be told by mid-February.

Please pass this information on to anyone who might be interested.

Below are two reports from bursary recipients in 2013.

Invertebrate Surveying Techniques At Kindrogan Field Centre

By Michael Goldie

Thanks to a BRISC bursary I was able to attend a four day residential course on Invertebrate Surveying Techniques. Jeff Clarke our course tutor introduced himself, and straight away made us all feel welcome and at ease. It was made clear that the course would be relaxed but however it would be full on and to expect some very late nights! Overall, it was tailored to suit our individual needs along with the group needs to achieve our learning outcomes. The programme covered various topics including invertebrate families, keys to aid in identifying the family and species of various invertebrates, trapping methods and surveying techniques, tips for identification and habitats.

Our base was the laboratory where we were each assigned a microscope and various implements, thus allowing us to manipulate and identify a large number of invertebrates that were successfully trapped. The most useful implement by far was bluetac, as this aided in holding and displaying the beetles and spiders in the various poses required, as it could be easily moulded.

A number of trapping methods were explained and utilised, with the firm favourite being sheet trapping for moths. This made for a great social event where moths were discussed and



Rosy Rustic (*Hydraecia micacea*)

identified at leisure. This set up consisted of a 125 Watt Mercury Vapour bulb suspended over a white sheet and in the centre being some upturned egg cartons. As it got dark by the woodland edge, a good number of moths appeared and

began landing on the sheet and within the cartons. Many of the moths were identified such as Pink-barred Sallow, Dun-bar, Lesser Broad-bordered Yellow Underwing, Small Wainscot, Antler Moth, Dark-marbled Carpet and Rosy Rustic to name a few.



5-spot Ladybird (*Coccinella 5-punctata*)

The technique of using sweep nets and catch nets was explained and demonstrated by Jeff, and later we managed to get the chance to perfect our technique on the banks of the nearby River Tummel. The afternoon was spent carrying out a target specific survey for the rare Five-spotted Ladybird as they had never been recorded at this location. The bank consisted of unstable vegetated shingle, the ideal habitat for these insects, so it was a perfect opportunity to see how effective these methods were. It wasn't long before one was netted and several more were observed nearby. This certainly proved to be one of the highlights of the course.

Sedges and Rush ID at FSC Kindrogan

By Laura Cunningham

I currently work as Project Officer at Cathkin Marsh Wildlife Reserve, a wetland site in South Lanarkshire owned by Scottish Wildlife Trust and was grateful to receive a grant from GNHS/BRISC to attend a sedge and rush ID course.

On the first day at Kindrogan Field Studies Centre our group headed to a site near Schiehallion influenced by an old lime kiln. Species growing along the track were those typical of base enrichment areas and included *Carex flacca* (Glaucous Sedge) and *Carex pulicaris* (Flea Sedge). Over the road towards Loch Kinordachy we found three species of rush, *Juncus effusus* (Soft Rush), *Juncus conglomeratus* (Compact Rush) and *J. acutiflorus* (Sharp-flowered Rush). Our tutor Fred (Rumsey) demonstrated a simple method of

quickly differentiating between Soft Rush and Compact Rush, by twirling the stem between the fingers – the stem of *J. effusus* being very smooth and that of *J. conglomeratus* being ridged (and also a paler green to the very bright stem of Soft Rush).



Juncus acutiflorus or Sharp-flowered Rush

Other species encountered included *Carex nigra* (Common Sedge) the commonest species of the cyperaceae family found in the UK, *Carex hostiana* (Tawny Sedge) and *Carex echinata* (Star Sedge).

At the mire site we travelled to before lunch (Lochan daimh) there was *Carex rostrata* (Bottle Sedge), deer grass and *Eriophorum latifolium*, which has yellow-green foliage and a brighter whiter head in a shorter, neater tuft with rough stalks (Fred tested this with his tongue) compared to, *E. angustifolium*, which is more blue grey. Here we also saw good examples of Hare's Tail Cottongrass (*E. vaginatum*) the foliage of which has a fine prickly tip.

Bottle Sedge was the first species we came across that I was familiar with, as it is abundant on Cathkin Marsh. This species, along with *Carex nigra* and *Carex aquatilis* are monitored at the reserve annually to assess the impact of the grazing project and to monitor changes in vegetation year on year. I also learned how confidently to identify *Juncus squarrosus* – which has a rolled stem (reminding me of celery), particularly near the base. This species is tough and unpalatable to grazers.

At the third morning site we found Hair Sedge (delicate and dangly), yellow mountain saxifrage, *Juncus alpinoarticulatus* (round fruit, obtuse petals, reddish tinge) and Scottish Asphodel.

In the afternoon we travelled to Rannoch moor to find the Rannoch Rush (*Scheuchzeria palustris*) which is localised to this area and can be found in sphagnum rafts along with three more sedges – *Carex pauciflora*, *Carex limosa* and *Carex magellanica*.

Day 2 Glas Maol

We headed to Glas Maol to find upland rushes and sedges. We found *Juncus trifidus*, *Juncus castaneus*, *Juncus bulbosa*

and *Juncus triglumis*. Sedge highlights of the day were *Carex rariflora* and *Carex atrata*.



Carex rariflora

I also learned that *Carex bigelowii* (Stiff Sedge), the dominant mountain upland sedge, has stomata on the underside of the leaves, to preserve water loss, whereas on *nigra* and *aquatilis* the stomata are on the upperside. Hybrids can form between these species which may have stomata on both the upper and lower surfaces of the leaves.

Carex atrata (Black Sedge) was found after shuffling along a ledge and everyone was impressed by the triangular stem, which one participant described as 'like a toblerone'. This species grows on calcareous cliff ledges and besides the triangular stem, a key character in identification is the male spike, which is not terminal as is typical of most sedges.

Day 3 lowland fens

In the morning we headed to a tall herb fen near Marlee Loch and investigated the differences between grazed and ungrazed areas. We found Toad Rush, *J. bufonius*, growing in the bare areas that had been poached by grazers. On the ungrazed area we found *J. acutiflorus* (Sharp-flowered Rush) growing abundantly with Bottle Sedge, and in the wetter areas *Carex aquatilis* dominated. In a shaded corner of this site we discovered *Carex remota*, another commonly found sedge, with Skullcap growing amongst it.



False Sedge (not a carex!)

After lunch we headed to Glen Fender, near Blair Atholl, to a species rich mire to find uncommon deer sedge and false sedge. At this site we came across bur reed and the extremely rare brown bog rush - a quite unspectacular plant which looks very similar to deer sedge and could be easily overlooked.

Close to the field centre we stopped on the way back to look at bladder sedge, a very sharp leaved sedge like a giant bottle sedge, and pale sedge, a top heavy sedge which tends to flop over.

Day 4 – Ben Lawers

Another day on the hills and thanks to Fred's expertise we saw all three of the species that are found in mica schist mountains. *C. microglochin* was found just before lunch, a species which can be found in this single corrie in the whole of the UK and which resembles a much daintier version of the flea sedge.



C. microglochin



Extreme botany with Fred Rumsey

C. saxatilis was found after climbing a particularly steep slope and (after a worrying wee while) we found the star of the show, *C. atrofusca*, a species found in fewer than ten Scottish sites and having a somewhat scorched appearance.

By the end of the day we had seen 51 sedges and rushes during the course..... (not including hybrids!)

BOOK REVIEWS



Peterken, George (2013). *Meadows*. The British Wildlife Collection No. 2, British Wildlife Publishing Ltd., Gillingham, Dorset, 431 pages 242 x 166 mm ISBN 978-0-9564902-4-7 hardback: RRP £29.95 around 300 colour illustrations.

This volume has been produced as No. 2 in a new series of Natural History books initiated by British Wildlife Publishing, already well known for an informative magazine with in-depth articles on all aspects of British natural history. The first book in the series was entitled simply *Mushrooms*¹. This second volume follows this same pattern with a one-word title *Meadows*. One wonders if this has been imposed by the publisher on the authors in a desire for bibliographic uniformity. The work that George Peterken has created deserves much more. *Meadows in Time and Space* would do greater justice to the content of this magisterial work which describes the history of meadows, their management, occurrence, and distribution since the beginnings of Neolithic farming. We are even reminded that it was the great Roman agrarian Lucius Columella (AD 4-ca70) who first provided a written account of meadows and described their leading role in agriculture. The Romans gave the meadow the name *pratium* from the fact that it was immediately ready (*paratum*).

It is against this immense historical and geographical background that Peterken has traced the variation to be found in meadows from alpine slopes to lowland water meadows. Such a history is complex, as it requires an analysis of geography, climate, pastoral ecology and regional botany. In doing so Peterken has created not only a work of scientific history but also a memorial to a way of life that has now almost gone. The book is therefore timely as the ancient traditions involved in maintaining meadows and hay-making will shortly be beyond living memory. The volume is extensively illustrated in colour throughout with many outstanding images and maps of meadows past and present.

One of the greatest achievements of this book is the exploration of the meadows of Britain from top to toe. In this survey we are made aware that species-rich meadows are not just a feature of climatically-favoured southern sites but can also be found in the North. The example from the Shetland Isles of Aith Meadow where 80 plant species are recorded is an outstanding example. This degree of diversity is impressive as it equals, and even in some cases exceeds, the record numbers in more southern locations, such as reported by Fream in 1888 for North Charford with 74 species; and by Lawes and associates for the Park Grass meadows at Rothamstead with 85 species. A significant richness in flora can also be found in the salt and wind-blasted Atlantic shorelands of the Hebridean machair.

¹ Reviewed in *BRISC Recorder News* No 88 (January 2013)

The alpine meadows of Continental Europe are similarly discussed. Peterken has personally explored outstanding examples still to be found in Eastern Europe, in Moldavia and Romania. The wood-meadows of Scandinavia, Russia and the Baltic States are also described. In Sweden, wood-meadows were once enormous and can still be seen on Gotland and Öland. Linnaeus at the age of 34 traveled through these Baltic islands and in his *Iter Gotlandicum* of 1741 listed many species that can still be found in these same meadows today (Edmondson, 2007). However, Peterken makes no mention of Linnaeus' original and detailed contribution to the history of these floristically rich meadows.

Water meadows have a long history, and Peterken recalls that Pliny the Younger in a letter to a friend referred to the importance of water for meadow productivity and also the need for its timely removal into the Tiber. The maintenance and management of water meadows is extensively discussed and illustrated with historic photographs and maps, which makes it surprising that no mention is made of the great Irish waterway: the Shannon and the callows that border its middle regions. The Shannon callows are probably the greatest unregulated floodplains in Western Europe and flood up to a mile across in winter. The Irish word *caladh* denotes a river meadow and was anglicised to *callow* in the early part of the 19th century. The flood-prone callows have a place among the wetlands of the World and are still a significant source of hay. The callows are also of enormous conservation importance, hosting birds of international importance (Heery, 1993). They have been a refuge for the Corncrake but sadly their numbers have declined in recent years, (unlike the machair of the Outer Hebrides where their distinctive call is still readily heard).

Throughout the book there has been a deliberate choice to use only English vernacular names, presumably to provide an open door to all and to avoid any semblance of botanical elitism. In the view of this reader this is frequently irritating. There is no standardisation of the English vocabulary with regard to plant names throughout either the British Isles or Ireland. Given the multitude of species of sedges, buttercups, and orchids that are to be found in meadows across Europe adherence to vernacular English creates confusion. While reading the text, unless one has an intimate knowledge of so-called common names, it is frequently necessary to refer to the list of Latin names at the end of the book. Even there the arrangement is not always logical, e.g. the Common Yellow Sedge (*Carex demissa*) is not listed with the other species of *Carex*.

This excellent book finishes on an encouraging note in looking to the future of meadows with a discussion of community involvement and management. The questions arise as to how they may be restored or even recreated. The penultimate striking image is of a newly-sown meadow gracing the surroundings of the London Olympic Stadium in 2012. *Meadows* is without doubt a welcome addition to any natural history library.

R.M.M. Crawford

References

- Edmondson, J. (2007) *Linnaeus' Öland and Gotland Journey 1741*. The Linnean Society of London and Gyllene Snittet HB, Uppsala.
- Heery, S. (1993) *The Shannon Floodlands: A Natural History of the Shannon Callows*. Tír Eolas, Newtonlynch, Kinvara, Co. Galway.



Watson, K. J. (2013). *The Flora of Renfrewshire*. Glasgow Museums. Hbk £38.99. ISBN is 978-1874657-54-4

I was delighted when asked to review Keith Watson's long awaited 'Flora of Renfrewshire'. I was brought up in Clarkston and have lived in Bridge of Weir for 33 years and it was the plants in Renfrewshire that inspired me to study Botany. The privilege has been mine to accompany Keith recording some interesting sites near my home. His knowledge is truly comprehensive, acquired through 25 years botanising in Renfrewshire and surrounding areas. Keith is Glasgow Museums Botany Curator. He is also a co-author of 'The Changing Flora of Glasgow' and has been the recorder for Renfrewshire (vice county 76) for the Botanical Society of the British Isles since 1994.

This is the first full flora of Renfrewshire. Keith's aim was 'to list all the plants – native and alien, past or present - recorded as growing wild in Renfrewshire'. To do this, he has thoroughly researched and included all historical records of plants in Renfrewshire. However, this book is so much more than a checklist. The acknowledgements alone reveal the range and depth of professional knowledge incorporated. The introductory chapters include geology, soil, climate and detailed habitat definitions and descriptions. The changing environment from prehistory to modern times is described too, along with the history of recording in Renfrewshire.

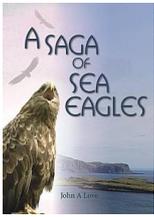
The catalogue of species includes more than 143,000 records, mostly made at 1km square level. Over 1500 species accounts include status, first record, distribution and ecology and are represented on over 660 dot maps. There are also 24 pages of colour plates of maps, and photographs of landscapes and notable species.

In his analysis, Keith discusses the patterns of change in the distribution of species in relation to the environmental variables described in the introduction. Consequences of agricultural practices, development and urbanisation are discussed fully. This leads on to assessment of conservation issues, and present categories of species protection and habitat protection are examined critically, reflecting Keith's work and influence in local conservation. A table detailing botanical hot-spots follows this discussion, illuminating just how many interesting species, nationally-threatened and endangered ones included, can be found in Renfrewshire. A real botanical treasure trail is laid out to be explored.

This book will undoubtedly have a long lasting legacy. It represents a milestone in recording in Renfrewshire and will be an invaluable reference in conservation issues as well as a reference for professional and amateur botanists and naturalists. It has enough general interest to be attractive also to anyone interested in their local area. The book has deservedly been chosen as September's Book of the Month by the Books from Scotland website.

The book has been published with support from Glasgow Natural History Society, Botanical Society of the British Isles, Renfrewshire Council, University of the West of Scotland and Paisley Natural History Society.

Alison Moss



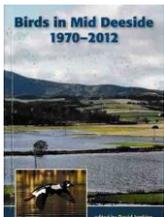
Love, John A. (2013). *A Saga of Sea Eagle*. (Whittles Publishing, Dunbeath, Caithness. ISBN 978-184995-080-0 Sbk £19.95

This book is essentially an update of the author's *Return of the Sea Eagle* of 1993, embodying some of the older work but adding a great deal that is new after two decades of progress. There are chapters on the eagle in

fact and fiction, and one which is an extended discussion of its food, showing how rare it is for Sea Eagles to take living lambs or indeed much else apart from carrion, fish and certain birds, especially gulls and waterfowl. The older history of the Sea Eagle in Britain is treated in depth; there is good evidence that it was once familiar in the south and east of England, as well as in Scotland and in mountainous areas elsewhere in Britain such as the Lake District. There is a chapter on its persecution in recent centuries: out of a sample of 45 sites known in the 18th century, 40 were still occupied in 1820, falling to about 25 in 1870; numbers then plunged to its pathetic final extinction in 1916, due entirely to ignorant shooting by gamekeepers and farmers, and to finally to egg collectors. The second half of the book deals with the reintroduction and establishment of the Sea Eagle, first to Fair Isle, then to Rum, a task to which John Love has devoted much of his professional career and of which he must be intensely proud. He shows how much was owed to the goodwill and co-operation of the Norwegians, and to the friendly and helpful attitude of the RAF and other authorities. The book was published just too late to include mention of the breeding of the first pair in Fife this summer, the first outside the Highlands for centuries, though it does cover the story of the Lowland introduction up to this point.

It is a most attractively written and presented book, with excellent drawings and most of the photographs by the author. Altogether it is a most welcome addition to the library of anyone with an interest in the Scottish natural world.

Chris Smout



Jenkins, David (ed) 2013) *Birds in Mid Deeside 1970-2012*. Obtainable from TLA publications, Whitewalls, 1 Barclay Park, Aboyne, Aberdeenshire, AB34 51F

As a "patch watcher" I am always attracted to local stories, and at 80 pages this book promises a digestible taster of the area covered - something locals can enjoy and

which gives "outsiders" or newcomers to the area a taste of what is around and where. The book feels well presented and is visually enlivened with a sprinkling of colour photographs and charts.

The first forty pages present a systematic list, which distils four decades of bird reports into a small space, finely balancing enough information with readable brevity. It's a nice introduction to the area's birds, and with some surprises. The rarity of Shoveler was more surprising, to me at least, than the Golden Eagle's sorry but perhaps more predictable tale.

The book then turns its focus on three more specific areas. The first is the changing date of the first appearance/song of locally breeding birds over time, perfectly illustrating how local studies can reflect global matters. This section also has some surprises in terms of former summer visitors now

wintering. The second is on waders and gulls, where again the story leaks from the local and into the broader world, firstly with respect to wader migration and inland migration paths, and secondly in terms of Black-headed Gull colony failures which may raise a red flag beyond the immediate area. The final section casts a broad historical eye over breeding birds at Finzean and Forest of Birse, revealing the fruits of long term study.

All in all this covers a local area nicely while throwing other food for thought in for good measure.

Alistair Shuttleworth



Goulson, David. (2013) *A Sting in the Tale*. Jonathon Cape . Hbk £16.99

Dave Goulson's book 'A Sting in the Tale' is not an A-Z about British bumblebees (there are other books for that) but a wonderful informal account of the his life in ecological research, stimulated by his boyhood exploration of garden and countryside.

Discovering the Watkins & Doncaster catalogue – then *the* supplier of those wonderful tools for naturalists, was a "seminal" moment and with his first purchase of a professional kite net at eight, he embarked on his entomological career.

However, over the years, as his scientific work revealed the plight of bumble bees, he grew more frustrated with the limited reach of the scientific results to those people actually managing and influencing the countryside. This led to the founding of the Bumblebee Conservation Trust in 2006 which dramatically raised the public profile of this group and helped establish conservation projects from the Hebrides to Dungeness.

Opening with an historical incident is a good introduction to the roles of nature, economics and science. On finding that British red clover was not setting seed in New Zealand pastures in the 1870's a solicitor, R. W. Fereday in New Zealand, worked out the cause. He found it was the lack of bumblebees (not then present in any Antipodean islands) whose long tongues are able to pollinate the flowers. The answer – to import bumblebees from England of course. There follows the funny and sad account of several unsuccessful introduction attempts but eventually four species did survive, the buff-tailed most successfully but also the short-haired bumblebee, which became extinct in the UK in 1998 after the last ostensibly fell into a pitfall trap and drowned!

When a chance came to introduce this species back to the UK, the obvious place seemed New Zealand, now home to the British species. However.....and thereby hangs a salutary and fascinating tale of a genetic bottleneck to which he returns in the last chapter.

The whole book is full of fascinating insights as impossibly patient and dedicated people set out to explore questions such as how abundant are bumble bees, how do bumble bees find their relatively small nest? How far do bees travel to forage and what flowers do they choose? What is so good about clover and leguminose flowers? Does body size matter and why? How do bees avoid wasting energy visiting flowers which have had their nectar recently taken? Could bumbles assist the spread of an alien invasive plant? Why Dutch tomato production would be more expensive

without them, how come there are bees in arctic regions, but not in hotter regions....

The many and varied scientific, imaginative and inspirational methods used to explore these questions gives a rarely seen glimpse into the everyday life of this scientific research. Who will forget the traffic cone taped to the exterior of the seventh floor wall of a science lab to help guide bumbles to their artificial tunnels, or washing bees feet with solvent? The hours of observation carried out by volunteers sitting in their gardens and countryside (gin and tonic optional) staring at a 6m x 6m square for twenty minutes, watching for bumblebee traffic. Results – 716 volunteers found 215 nests and gardens averaged 36 nests per hectare whilst farmland was home to many fewer. The experiments with sniffer dogs to find nests – some humans were as good if not better; the use of minute transponders stuck to a bee's back and vehicle-mounted-harmonic radar to track foraging behaviour. Besides discovering that bees travel about 25km/hr and regularly more than 1km for flowers, the transponders can also impale foxglove flowers, rather weakening the signal!

The stories of the scientific work are also, unusually, spiced with accounts and tales of his many named students and volunteers (including our own editor!) without whom much less would have been discovered about bumble bee ecology. It is heartening to see the very important roles of teamwork in ecological research and of 'citizen' science so publically and engagingly acknowledged.

The mix of science and adventure recounted in *A Sting in the Tale* make an inspirational and informative book even for tired old ecologists. But I would also recommend it for anyone hovering on the edges of a career in ecology or science and especially anyone with a general interest and sympathy towards our natural world.

Sarah Eno

Dates for the diary

- **Wednesday 9 October, 10:00am-3:30pm Crane fly identification** – at the Zoology Building, University of Aberdeen. Course leader John Kramer of the Crane fly Recording Scheme. Participants may also bring along any specimens for identification on the day, which is free but booking essential. Email glenn.roberts@aberdeenshire.gov.uk
- **Friday 15 November – the NBN Conference** at The Royal Society, London. For further details see the NBN page below.

Saturday 9th November 2013: Molluscs in Scotland. A joint meeting of the Conchological Society of Great Britain and Ireland & National Museums Scotland, at National Museums Scotland, Chambers Street, Edinburgh EH1 1JF, at 10.00 for 10.30.

At 14.00 there will be a Public Lecture: Scotland's living reefs, given by Dan Harries of Heriot-Watt University

There will be no charge for this meeting, but please contact Adrian T. Sumner if you plan to attend (preferably by e-mail, adriantsumner@btinternet.com, or by telephone, 01620 894640), and see the Conchological Society's website for full details

(www.conchsoc.org/pages/workshops.php)

Updated Programme for BRISC Annual Conference on the theme of “New Technologies for Biological Recording” Saturday 26 October 2013 At Newbattle Abbey College

09.30 – Registration – Teas/Coffees

10.00 – Welcome by BRISC Chairman
Jonathan Willet.

10.10 -10.40 Neil Gregory, “Record Wildlife” app and the growing use of technology for recording

10.40-11.10 – Stephen Moran, Highland Biological Recording Group (HBRG)

“Extracts from an Entomological Life: mobilising the records of the late Philip Entwistle.”

11.10-11.20 - Comfort Break

11.20 – 12.40 - - A series of short presentations on various apps, websites and other recording methods and a chance to browse what is available.

The following short presentations are now confirmed:

- **Dragon finder (app) – James Stead, Froglife**
- **Bumblebees (app) and Bee Walks - Anthony McCluskey, BBCT**
- **iRecord and NBN Gateway - Graham French, NBN**
- **Open source mapping and recording - Graham Esson, Perth and Kinross Council**
- **SWIFT, SNH's new program to undertake Site Condition Monitoring on SSSIs using tablets/ smartphones. – Zoe Russell, SNH**
- **Natures Calendar and other recording initiatives – Christine Tansey, Woodland Trust**

Other possibles – to be confirmed:

- App/s on tree health with the Forestry Commission
- apps about invasive plants

12.40 – 13.00 - AGM

13.00 – 14.00 LUNCH and Raffle Draw

14.30 – 16.20 - Field trips to the extensive grounds, with different groups using the various recording methods

16.20 17.00 – Teas/ Coffees, - Depart

To book, please contact Louisa Maddison, BRISC Secretary, by email briscsecretary@live.co.uk or by Tel: 01355 276880

A booking form has also been included in this mailing with costs and how to get there- or ask Louisa.

Copy Deadline for the January issue of Recorder News is 20 December 2013.

All material please in electronic format to the Editor at [anne-marie@smout.org]. For postal address see BRISC contacts on p.2.

NBN Gateway news

Launch date for release of NBN Gateway version 5

We are pleased to announce that the launch date of the new NBN Gateway will be 18th October. As we have communicated throughout the development stages, there will be lots of new elements to the new NBN Gateway, but here's a brief reminder of some of the key new features:

- Better performance, greater reliability and stability. It will have the ability to cope with increased volumes of data and the new functionality
- More flexible. Users can request access and download precisely the records they need, filtering data by taxonomy, geography, date, datasets and designations.
- Greater accessibility - what you see is what you get. Details of all records except sensitive records can be viewed on screen.
- Improved download functionality. For example data downloads will be supplied in a single table rather than a separate table per datasets.
- Users will now need to log in if they want to view record details on screen or download data
- Totally new interactive map. It will be possible to select and query multiple records and create coincidence maps of two or more species in different colours
- For data providers it will be much easier to administer datasets and organisations, deal with access requests and proactively grant access. Data providers will also get better feedback on who has been using their data and for what purpose.

Please see the NBN website for further information and key dates for the transition period, or contact us on access@nbn.org.uk if you have any queries.

NBN News

NBN Conference

Time is running out to register for this year's NBN Conference, which takes place on Friday 15 November at The Royal Society, London. With a keynote address by Barry Gardiner MP and the Sir John Burnett memorial lecture being delivered by Professor Bill Sutherland the programme of presentations will have something of interest to everyone. The full programme can be found on the NBN website in the Events Calendar: <http://www.nbn.org.uk/Events-Training/Events-Calendar.aspx> Booking deadline is 31st October and discounts are available for NBN Trust members. We hope you can make it.

11th INTECOL Congress, Ecology: Into the next 100 years

From Sunday 18th to Thursday 22nd August the NBN Trust was one of the stand holders at the INTECOL Congress at ExCel, London. The International Association for Ecology (INTECOL) Congress takes place every four years and this, the "11th INTECOL Congress, Ecology: Into the next 100 years" was held in London as part of the centenary celebrations of the British Ecological Society. The theme of the Congress was "advancing ecology and making it count", which sought to present world class ecological science. It was billed as the largest ecological academic conference in the world and anticipated up to 2,000 delegates including academics, policy-makers and senior level executives within the ecological arena. The NBN Trust stand incorporated a 32" touch screen on which we demonstrated the NBN Gateway (current and new version) and iRecord. International delegates were impressed with the easy accessibility of data via the NBN Gateway, while UK visitors were very keen to try out the new functionality of Gateway version 5, with coincidence mapping being a popular new feature.

In Practice

NBN Trust supports delivery of SBIF Action Plan

The Scottish Biodiversity Information Forum working group on data flow and data sharing, which is chaired by Paula Lightfoot (NBN Trust) and Dan Chapman (Centre for Ecology and Hydrology) has agreed to lead on the delivery of three key actions from the SBIF Action Plan, namely:

- Pilot a model data pathway
- Compile and disseminate case studies that illustrate good practice and the value of data gathering and sharing for conservation and management in Scotland
- Support Local Environmental Records Centres to carry out a gap analysis on their data holdings and to identify if data available through the NBN Gateway can fill the gaps.

The group has recently been expanded to ensure representation across a wider range of sectors, including museums, local authorities, ecological consultancies, national parks and other organisations involved in practical habitat management. The group will meet in early October to formulate a strategy for the delivery of these actions.

New NBN leaflet available

Are you studying for an undergraduate or postgraduate degree in ecology or a related subject? Are you a science-professional carrying out biodiversity research? Do you need quick and easy access to information on species, habitats and designated sites in the UK to support your studies or research? If so, then the new leaflet we have produced may be of interest to you.

"Using Biodiversity Data for Research" explains how to get the best from the data available on the NBN Gateway as well as giving examples of how data are already being used for research. You can download the leaflet or order a printed copy from the Publications page on the NBN website: <http://www.nbn.org.uk/Tools-Resources/NBN-Publications/Leaflets.aspx>

Did you know?

New Data Management System for Ecological Consultants

The NBN Trust is working with the Chartered Institute of Ecology and Environmental Management, the Association of Local Environmental Records Centres and the Biological Records Centre to develop a biodiversity data management website for ecological consultants. Key features include:

- Data entry forms designed for specific survey methodologies
- Data entry in the field (via smartphone or tablet) or in the office
- The ability to set a data release date for each project as agreed with the client
- A range of data download options including GIS formats
- The ability to tag records as 'sensitive' to restrict their availability to only approved users

The system will enable consultants to share their records without any extra effort. A steering group has been set up to oversee development to ensure the system fulfills consultants' requirements and makes their work easier. A prototype system has been developed with their input, and will be tested and refined over the winter prior to full release in Spring 2014. The project is funded by Defra through their contract for the development of the National Biodiversity Network.