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From the Editor

The current issue, unusually, contains three articles, one of which is by another first-time contributor, John Webster. All three pieces represent valuable aspects of personal research and fieldwork by naturalists of our area.

Two Field Meeting reports held over from 2010 are also included here. Considering the record low temperatures and long cold period of the past winter it is perhaps surprising that this is not more widely reflected in the current issue: the very large influx of Waxwings was certainly the most noticeable and memorable event.

David Clarke, Editor

Society News

We are pleased to announce a joint meeting with the British Entomological & Natural History Society, on 7th May 2011. The theme is 'Upland Insects' and is being hosted by Tullie House Museum and the Cumbria Biodiversity Data Centre. Details are being circulated separately: places can be booked for free and any readers of the *Carlisle Naturalist* are welcome to attend this interesting day.

Additions to the Library

Atropos Nos. **40**, **41** and **42** (summer 2010 – winter 2011) given by Geoff Naylor.

Scottish Birds Vols. **29** (1) – **30** (2) (June 2009 – June 2010) given by Geoff Horne.

Museum News

Cumbria Biodiversity Data Centre launched

Following the formulation of a business plan and appointment of a Centre Manager, Teresa Frost, biological recording at Tullie House has taken a significant step forward. We are sorry to be losing Matt Grose as Biological Data Officer as he plans to emigrate to New Zealand: his contribution over several years has been key to this development. His post should soon be filled.

The Cumbria Biodiversity Data Centre still operates from Tullie House and is looking forward to further strengthening its links with the natural history community, as well as providing a much-needed data service to conservation organisations, planners, consultants and other biodiversity data-users.

These notes cover the period between October 2010 and March 2011 and are compiled from records submitted by members.

Almost two months (December and January) of this period saw the hardest winter for many years with severe frosts and snow covering for several weeks. Compensation appeared in the shape of a **Waxwing** 'invasion'. The first report was of a flock of 20 at Denton Holme on October 26th (M. Gardner). The Dalston area held the largest numbers (Plate 1), with up to several hundred in David Hickson's nursery garden and 30 or so at nearby Sowerby Wood. There were large flocks in the West Walls area of Carlisle and at Wetheral. A total of at least twenty records was submitted. These included sightings in members' gardens, including my own, where Waxwings were last seen on January 2nd, although 2 were reported much later at Wigton on March 1st (R. Hodgson). Other unusual garden visitors comprised a few **Fieldfares** here and there, a few **Bramblings** in Carlisle (D. Iveson), with 60 in trees of a Penrith garden, where **Tree Sparrows** and **Reed Buntings** were regular through the winter (S. Hewitt). Up to 20 **Tree Sparrows** were also seen in a Stanwix garden in January (J. Strutt). There were also reports of larger than usual numbers of **Redpolls**, **Siskins**, **Blue Tits** and **Yellowhammers**. **Blackcaps** were seen early in 2011 in Dalston and Denton Holme.

Away from gardens and, going back to 2010, up to 2 **Bitterns** were reported regularly from Siddick Pond between mid-November and early January. Also, there was an unusually large flock of 150 **Goosander** there on February 27th, and at least 2 **Water Rails** during the winter months (all from K. Mawby). Again back in November, a **Gannet** was found grounded on a road near Raughton Head and taken into care (A. Abbs). Good numbers of **Whooper Swans** were recorded on the Solway Plain, e.g. 300 at Wedholme Flow on November 10th and 127 near Whitrigg on February 2nd (both F. Mawby). A small flock of up to 20 inhabited a traditional field at Walby between late February and late March. A **Black Swan** visited Talkin Tarn during the coldest part of winter up to January 3rd when its usual haunt of Tindale Tarn was frozen. Unusual geese included 2 **European White-fronted Geese** at Walby on November 1st (N. Franklin) and a **Brent Goose** at Grune Point on November 3rd. A **Snow Goose** at Great Broughton on the same day (K. & A. Mawby) was almost certainly feral or escaped, as was undoubtedly the Black Swan at Talkin. One, sometimes two, male **Smew** were seen at both Tindale and Talkin Tarns between December 28th and January 26th. A **Shoveler**, unusually at Castle Carrock Reservoir on November 4th, completes a round-up of wildfowl records and coincided with a record of a **Red Kite** close to the reservoir on the same day (J. Miles). More frequently seen, **Merlins** were reported at Cardurnock on

November 10th and Border Marsh on November 14th (FM).

The only waders of note were a **Jack Snipe** at Wedholme Flow on November 8th and a very late or overwintering **Greenshank** at Calvo Marsh on November 15th (FM). On farmland near Thurstonfield, the unusual sight of 5 **Woodcock** flushed was reported by R. Dixon on February 20th. There were five records of **Barn Owl**, widely spread. Sadly, one at Forest Head was found dying with a broken wing (R. Dixon).

The regular **Brambling** flock at Talkin Tarn reached a peak of only 100 in November and early December and there were often far fewer. Several flocks of up to 300 **Twite** inhabited various Solway marshes in mid November (FM). A **Great Grey Shrike** was reported to the Museum at Long Marton on January 7th and subsequently seen by a number of members.

With milder weather from mid-March, the first returning summer visitors appeared. Earliest was a **Chiffchaff** at Watchtree on March 14th and a very early **Swallow** reported from Southerfield on March 16th. **Sand Martins** and a few **Wheatears** were reported from several places before the end of March and there was another March **Swallow** at Talkin Tarn on the 30th. Also there, but just outside the record period, a flock of 18 **Bewick's Swans** was present on the morning of April 2nd before departing in a north-easterly direction. This is both a rare species and an unusually large number at that site (G. Naylor).

Other signs of spring were **Frogs**, sometimes spawning, in late February and the first butterflies, *e.g.* **Small Tortoiseshell** at Parton on February 26th (J. Read), and a **Comma** (Plate 2) and a fresh example of the day-flying **Orange Underwing** moth at Fishgarth Wood on March 28th (D. Clarke). The uncommon hoverfly *Melangyna quadrimaculata* was noted by S. Hewitt at willow blossom by The Sands in Carlisle on March 14th. **Yellow Star-of-Bethlehem** (*Gagea lutea*) was at peak flowering at Fishgarth Wood on March 24th (Plate 2), with at least 16 spikes in one 200 metre stretch (DC).

The only other sightings of note during the period were mammals, notably **Otters**, with reports from Ambleside, Siddick Pond, Cardurnock and the memorable images from Ullswater shown by Steve Hewitt at the penultimate indoor meeting of the Society. All these occurred during the first three months of 2011. Finally, there were unwelcome reports of **Grey Squirrel** at Watchtree on March 1st and at Fishgarth Wood on 24th – noted there for the first time in an area sometimes used by Red Squirrels (DC).

Geoff Naylor

14th August 2010: Watchtree Nature Reserve

Leader: Frank Mawby

Watchtree Nature Reserve was created in 2002 over the 2001 Foot and Mouth Disease carcass disposal site in the old Great Orton WWII airfield. The site covers 84 hectares of heavy land and old concrete runways much of which has been in agricultural use since and before the war (when it was Watchtree Farm) apart from three small woodlands and small areas of semi-natural grassland.

Watchtree joined the Marsh Fritillary captive breeding programme in 2010 and took on the late Richard Little's stock. He would have been pleased that we produced several thousand caterpillars in 2010, many of which Steve Doyle took to a new site in Ennerdale. Our first stop was to look at this year's stock of voracious caterpillars making short work of the Devil's-bit Scabious plants in pots in the cage.

The results of attempts to create diverse grassland habitats look encouraging, and several species seem to be thriving, especially Yellow-rattle. We had a close look at these plots and found Hairy Tare, Bush Vetch, Common Vetch, Lesser Trefoil, Alsike Clover, Selfheal, Autumn Hawkbit and Smooth Hawk's-beard. Grasses replacing the commercial fescue include Crested Dog's-tail, Sweet Vernal-grass and Cock's-foot. A good number of bumblebees were working the flowers, including Common Carder and Red-tailed. A Painted Lady butterfly, quite scarce this summer, and a Common Darter dragonfly were seen. The area is cut for hay in late summer and grazed by sheep through the autumn. This year hay-making was delayed until early August because several Skylarks were still feeding young.

The constructed wetlands were the next location. This area was constructed to receive and if necessary remove the remnants of nutrients from the burials area. It consists of a set of *Phragmites* beds that receive the deep ground-water and water from the burial cells effluent treatment plant, and four linear pools that act as the final settling areas. A large lagoon receives the water from the lake, into which all of the burials area surface water is drained, including surface water from the old airfield runway drainage system. This water finally discharges to the Pow Beck at a point where it is regularly tested by the Environment Agency.

The settlement pools were designed for wildlife, with wavy edges and variable water depths, and planted up with a variety of marginal plants and shrubs. They have matured to produce very clean-water pools with a steady flow-through. The submerged pond plants have all colonised naturally.

Of birds present Tree Sparrows were taking advantage of the feeders and still with third broods of nestlings in boxes in the narrow strip of woodland to the east side of the wetlands. Linnet, Swallow, Sand Martin, Willow Warbler, Robin, Whitethroat, and a Buzzard mobbed by Crows, were the other birds noted. At the

observation platform over the most southerly lagoon black aphids were swarming on Reedmace (*Typha latifolia*) and this was attracting many hoverflies and wasps, presumably either catching the aphids or taking advantage of the honeydew residue they were producing from the *Typha*. Dragonflies hawking the pools were Four-spotted Chaser, Common Hawker, Common Blue Damselfly, and to our delight two Emperor Dragonflies. Butterflies seen were Wall, Small White and a Small Copper.

After lunch we visited the burials area and the small fields created between the southern set of cells, which are being re-seeded and also planted up with Devil's-bit Scabious. This plant does extremely well in bare ground with no competition and it will be interesting to see how it copes when the grasses and other plants get going. They are planted in plots of 200 plants at close spacing.

As we progressed round the site along the north boundary Small Tortoiseshell, an abundance of Wall, and a few Meadow Brown, butterflies, another four Small Coppers and Painted Lady were seen. The old concrete perimeter track provides a calcareous habitat for a number of lime-loving plants, with abundant Bird's-foot Trefoil and Centaury, the latter now well past flowering. Fairy Flax, the eyebright *Euphrasia nemorosa*, and a large patch of White Stonecrop were also noted. At a nest in a small hut the writer ringed a second brood of Swallow chicks.

The pond in Pond Wood was dug as a duck-shooting pond some thirty years ago when much of the surrounding woodland would have been low scrub. Recently, the encroaching woodland to the south side has been cut back and the bank re-profiled to a shallower slope. The scrub re-growth is cut back every other year. The pond attracts a good number of Frogs, Toads, Palmate and Smooth Newts. Although Great Crested Newt has colonised the new water bodies, annual surveys over the last seven years have not found it in this particular pond. Letting in the light has caused an explosion of plants in the shallow water, with large beds of Common Spike-rush, Branched Bur-reed, Bottle Sedge and Broad-leaved Pondweed. Lesser Redpoll and Bullfinch were seen. The hoverfly *Episyrphus balteatus* was noted on Wild Angelica.

Nearly half the site is now woodland and scrub, and half the area of the northern burials cells is planted with trees or scrub species such as Gorse. A nice area of natural-regeneration Alder is developing well in Pond Wood. Here the tree mix is predominantly Scots Pine and Larch to attract Red Squirrels with small amounts of Norway and Sitka Spruce to provide cones when Scots Pines have poor years.

The walk through the remainder of this area and nearby Pow Wood was pleasant but uneventful. Pow Wood is a small woodland more typical of the Solway Plain, dominated by even-aged birch, suggesting it was clear-felled about 60 years ago.

The emergence of Oak and Alder, with Holly understory, suggests that it will develop into an interesting woodland over the next few decades. Honeysuckle is abundant and the mosses and ferns suggest a slightly acid soil. Wood Sorrel is present in the spring and other plants include Foxglove and Herb Robert. The woodland area has been doubled by the new planting and is dominated by Scots Pine and Larch which are growing at a tremendous pace.

Our last area to visit was the Lake, the primary purpose of which is to capture most of the surface water from the burials cells area. However, it was designed and planted to attract waterbirds and here we saw Mallard (3), Moorhen (5), Little Grebe (2), Snipe, Black-headed Gull, Pied Wagtail (3), Swallows and Linnets. It also has a growing population of Great Crested Newts.

During the visit, John Read recorded 35 species of beetle. Of these, three species of leaf-beetle, three species of weevil, one burying beetle and one rove beetle were uncommon or local in Cumbria.

Frank Mawby

20 August 2010: Wan Fell Moth-trapping evening Leader: Mike Clementson

Over twenty members attended this evening meeting. Wan Fell (NY5236) at an altitude of 200 metres in the Eden valley has a mixture of planted woodland, permanent pasture and low altitude heather moor. Using mercury vapour lamps over a sheet, and actinic light traps, Mike Clementson and Liz Still trapped thirty-seven moth species, all of which bar one were not especially unusual for the area. The exception was the 'Micro'-moth *Acompsia cinerella* which turned up at Liz's trap (see Plate 4). This is only the third record for the county of this species of the family Gelechiidae. Relatively little is known of its natural history; according to Emmet & Langmaid (2002) the species is widespread throughout the British Isles, eggs are laid on moss and the larva feeds in during May and June.

Species list

Chinese Character	Chestnut
Shaded Broad-bar	Centre-barred Sallow
Common Carpet	Sallow
Purple Bar	Mouse Moth
Chevron	Dark Arches
Barred Straw	Rosy Minor
Dark Marbled Carpet	Common Rustic <i>agg.</i>
July Highflyer	Small Wainscot

Lesser Swallow Prominent
 White-line Dart
 Large Yellow Underwing
 Lesser Broad-bordered Yellow Underwing
 Autumnal Rustic
 Ingrailed Clay
 Dotted Clay
 Neglected Rustic
 Square-spot Rustic
 Antler Moth
 Smoky Wainscot

Ear Moth *agg.*
 Crescent
 Flounced Rustic
 Straw Dot

 ‘Micro’ moths:
Acompsia cinerella
Apotomis betuletana
Bactra lancealana
Crambus perlella
Agriphila straminella
Agriphila tristella

Reference

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Mike Clementson



(Waxwing trees, Dalston, from a photo by D. Hickson)

A second Cumbrian site for the solitary bee *Andrena ruficrus* Nylander, 1848

On several visits to Finlandrigg NNR last year I concluded that the small heathland area in the centre had considerable potential for finding aculeates, since common species such as the solitary bees *Andrena clarkella*, *A. haemorrhoea* and their cleptoparasites *Nomada leucothalma* and *N. ruficornis* were easily located.

Full of enthusiasm to go out searching for mining bees after a long winter, I visited the heath in mid-March and was pleased to find *Andrena clarkella* already in evidence. The next sunny day I had available, March 25th, I returned to the *A. clarkella* nest site to take photographs. In addition to both male and female of that species, I found a small grey male *Andrena* that I could not easily identify. Male *Andrena* bees are notoriously difficult to identify, so I was pleased and surprised when it was joined by, and proceeded to mate with, a female of the species *Andrena ruficrus*. I was surprised because *A. ruficrus* is a rare bee, known only from one site in Cumbria (Cliburn Moss), a handful of sites in Yorkshire, and a little more regularly in north-east Scotland.

Fortunately I was able to take plenty of photographs of both the male and female, both separately and coupled (Plate 3), and the identification was confirmed beyond reasonable doubt by experts on the Bees Wasps & Ants Recording Scheme identification forum.

I visited again on April 3rd and was pleased to locate two males and again a single female, despite a stiff wind blowing and considerable cloud cover. This showed that, unlike some *Andrena* bees, *A. ruficrus* is able to take advantage of very short periods of sunshine, an adaptation of obvious value in an early flying and northerly distributed species.

Nick Franklin, 19 Eden St, Carlisle, Cumbria CA3 9LS

Records of some noteworthy beetles from Cumbria, recently added to the collections of Tullie House Museum

JR has recently been working on the entomology collections at Tullie House Museum. Part of this work has involved incorporating into the collection, specimens of beetles collected over the last couple of decades by SH. The project involved remounting, checking/determining, labelling and databasing several hundred specimens, many of which originate from survey work on the invertebrates associated with river shingle. This has resulted in the identification of a number of interesting records. Some of these have been previously published in this journal and elsewhere, whilst others have only been listed in unpublished survey reports. Several have never been reported at all and it seems worth here

recording some of the more interesting additions to the Museum's beetle collection, generated by various surveys and other field work in recent years. Some of these records are already incorporated in the *Checklist of Cumbrian Beetles* (Atty 2010), whilst others will provide some significant updates to it. The nomenclature follows Duff (2008). Species recorded for the first time in Cumbria are indicated by an asterisk. All specimens were collected by SH unless otherwise stated.

Dychirius nitidus (Dejean) (Carabidae)

Voucher specimens for new localities at Brownrigg on the R. Waver (NY17.52) and Greenodd Sands at Roudsea (SD32.18) were collected on 11th August 2000 and 29th June 2006 respectively.

Miscodera arctica (Paykull) (Carabidae)

Two specimens of this scarce upland ground beetle were found under stones near the summit of Dollywagon Pike (NY34.12) on 10th May 2009.

Bembidion stomoides Dejean (Carabidae)

A single specimen of this scarce shingle species was collected from shingle on the River Irthing at Newby East (NY47.58) on 20th June 2006.

Bembidion schuppelii Dejean (Carabidae)

Another river shingle specialist. One specimen was collected from the confluence of the Kingwater with the R. Irthing (NY52.63) on 4th May 2000, another was collected from a shingle bar on the River Eden at Oglebird Scar, Temple Sowerby (NY60.27) on 23rd May 2005 and two specimens were taken in pitfall traps operated on a shingle bank on Swindale Beck at Hall Garth, Great Musgrave (NY77.13) between 27th July and 3rd August 2008.

**Bembidion dentellum* (Thunberg) (Carabidae)

Several specimens were taken from a sandy shingle bank by the River Eden at Winderwath (NY59.29) in June 2004.

**Liocyrtusa minuta* (Ahrens) (Leiodidae)

Four adults in pitfall traps sited on shingle by the River Irthing at Kellwood (NY52.63) 28th July-4th August 2008.

Ocypus nitens (Shrank) (Staphylinidae)

One specimen of this rove beetle was collected at Dobbin Wood, Gowbarrow (NY41.20) on 25th January 2003.

Cyphon kongsbergensis Munster (Scirtidae)

This small wetland beetle has recently been recorded as new to Cumbria and England by David Atty (Atty 2009). One individual was collected from a mire at Swindale Head (NY50.11) 12th July 1999.

**Diacanthous undulatus* Reitter (Elateridae)

One adult of this very distinctive and large click beetle was reared by John Parker from a larva found in a dead Ash in Naddle Forest, Haweswater, (NY51.15) on 23rd March 2003.

Hylecoetus dermestoides (Linnaeus) (Lymexylidae)

One adult was collected in Low Intake Wood, Rusland (SD34.87) on 1st June 2003 by John Parker. First discovered in Cumbria at Winlatter Forest (VC 70) in 2001 (Read 2002).

Thymalus limbatus (Fabricius) (Trogossitidae)

Two specimens found on Oak at Rydal Oaks, Rydal Water (NY36.06) 30th March 2003 were collected before, but not identified until after, those found at the same site by David Atty in 2006 (Atty 2009).

Opatrum sabulosum (Linnaeus) (Tenebrionidae)

One adult of this large, all black notable darkling beetle was found in a sandy area close to the River Ehen near Sellafield Station (NY01.03) 11th May 2003. The only other Cumbrian record of this species comes from the same river, nearby at Braystones, reported by Liverpool Museum staff in 1992.

**Chrysolina americana* (Linnaeus) (Chrysomelidae)

A specimen of this iridescent green and red leaf beetle was found on a potted plant of Rosemary in a super-market in Carlisle in July 2008. This introduced beetle was first discovered in Britain in 1963 (Johnson 1963), and has since become established and naturalised in a number of sites mainly in the south-east of England (Cox 2007).

**Gymnetron beccabungae* (Linnaeus) (Curculionidae)

This weevil is associated with Brooklime and Marsh Speedwell. Two specimens were collected at Tewet Tarn (NY30.23) on 30th July 1995.

Acknowledgements

We wish to thank Magnus Sinclair and Alex Williams for their kind help with identification of some of the beetles recorded here.

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*John Read, 43 Holly Terrace, Hensingham, Whitehaven, Cumbria CA28 8RF
and Stephen Hewitt, Tullie House Museum*

The montane lichen *Umbilicaria crustulosa* (Ach.) Frey in Cumbria, with notes on two sites near Grasmere, including a new location

A Red Data Book species, this large pale grey foliose lichen of siliceous mountain rocks is arguably one of Cumbria's most notable lichens, and one of several species loosely referred to as 'rock tripe'. It was first found at its main site in Great Langdale in 1889 by J.A. Martindale of Staveley*, and for over half a century this was the only known UK location. Its importance is underlined in Wilson's *Flora* (Wilson, 1938) where, under its older name of *Gyrophora cirrosa*, nearly half a page of text and a photograph is allocated to it. At Martindale's original site it occurs in utmost profusion, covering hundreds of square metres of vertical rock between Raven Crag at least as far east as Stickle Ghyll.

The known range was expanded a little in the twentieth century, with sites being all on Borrowdale Volcanic Series rocks in the central Lake District. They include major crags such as Great Gable and Haystacks, and others in Eskdale. Three finds on different Lakeland crags made in 1962-3 by Derek Ratcliffe and Jim Birkett (a noted cragsman) appear to be the first of these new locations. Later finds by Ivan Day extended records further afield. Specimens from two of the Ratcliffe/ Birkett locations found their way into the Tullie House Museum collections. Recent chance conversations drew my attention to the existence of this material and stimulated a follow-up visit to one of the sites, near Grasmere, not least to make some comparisons with the Langdale situation. The packet data of the specimen states that it was from the 'second known locality in Britain' – presumably

indicating its collection date (19 November 1962) was also that of the locality's discovery.

The site concerned is in Far Easedale (NY30, tetrad E), where the species occurs on one major crag at about 370 metres a.s.l. on hard vertical rocks having a south or south-east aspect. Although nothing like as prolific as it is in Langdale, inspection in late October 2010 revealed a good scatter of the *U. crustulosa* on the eastern end of the crag in its lower half. Where it occurs, there are also long vertical runs of thalli of the related lichen *Lasallia pustulata*, some of which are large enough to flap in a breeze. At up to ca. 20 cm across they are presumably long-established. Yellowish-green when wet (Plate 5, right), *Lasallia* is particularly associated with nutrient-enriched water tracks from perching and nesting sites of upland birds, especially the Raven, which has traditional sites on this crag. Possibly the *U. crustulosa* also utilises such nutrient sources, but it occupies rocks that are most often dry. The areas of the crag that it is restricted to are particularly light in colour – the colour being due to the abundance of pale grey crustose lichens, especially of the *Aspilicia cinerea* species-group, which again is indicative of a long history of nutrient-flushing. A few thalli are quite large for this species, a few approaching the size of the larger *Lasallia*. However, *Lasallia* is the more abundant and widespread of these two 'rock tripe' species on this crag, occurring even on the summit rocks. When in a dry state it too can be greyish and care is then required to assess which species is present, especially when seen from some distance – and in this location the two are variously intermingled. The other major crag ranges in this valley, including the N-E facing Deer Bields, appear not to have the rare species – and very little of the *Lasallia*.

Whilst in this area on 3rd November 2010, I visited the adjacent valley northwards, Greenburn, where Blakerigg Crag (NY31A) has an aspect, altitude and, apparently, geology similar to the above site. It proved not to have anything like the abundance of *L. pustulata* (or indeed significant use by upland birds). Nonetheless, I did find *U. crustulosa* (Plate 5, left) at one point near the northern end of the crag. Here the species is present, often as quite large thalli, on smooth rocks sloping downwards at about 45°, with two main patches covering some 3-4 m² in all, with various outlying thalli lower down, such as those which first caught my attention. The slopes face approximately south-west. The patches were at about mid-crag height (with some being accessible), and at an estimated altitude of 430 metres. This is a new hectad for this species, currently the seventh site in Cumbria and the eighth for UK as a whole. The lichen does not appear to be present anywhere else on this range. Equally, inspection of the S-E facing High and Low Raven Crags (NY30J) at the foot of this valley, overlooking Grasmere, did not reveal any more of the rare species, though High Raven had some *L. pustulata*.

Unlike many other national rarities, its habitat ensures that *U. crustulosa* is probably more vulnerable to weather and to climate change than to human activity. The twentieth century records have clearly been slow to emerge nationally, perhaps due to sensitivities relating to other wildlife interest at some sites. Where thalli occur high on the crags, checking them with high power optical aids offers the only alternative to serious climbing, and for such reasons alone it could well occur undetected elsewhere. *U. crustulosa* was found in Glen Clova in 2006 by V. Gavarini, the first UK site outside Cumbria. Rather surprisingly, the new lichen *Flora* (Smith *et al.*, 2009) still refers to Great Langdale as the sole UK site. Elsewhere in Europe the species occurs in several of the more mountainous areas.

With thanks to Chris Hitch of the British Lichen Society, who kindly looked at my Easedale specimen; to Tullie House Museum, for access to its Cumbria material and records; to Janet Simkin, also of BLS, for database checking, and to Jeremy Roberts and Mo Richards whose conversation prompted my investigations.

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* The lives and botanical activities of Martindale and his two frequent associates, Joseph Martindale Barnes and George Stabler, are the subject of a new book *The Three-legged Society* by Ian Hodgkinson and Allen Steward, to be published by Lancaster University during 2011.

David Clarke, Burnfoot, Cumwhitton, Brampton, Cumbria CA8 9EX

Waterfowl at Talkin Tarn: a 21st century review

Geoff Naylor

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Talkin Tarn, some 26 hectares in area, is one of the few large freshwater bodies in north Cumbria. The tarn is natural in origin, lying in a glacially formed depression into and out of which small streams flow. It is shallow over most of its area, with a maximum depth of some 15 metres, and short-term freeze-over is not unusual in severe winters. Marginal aquatic vegetation is generally sparse, except in the sheltered north-east bay; the more exposed shores are either bare or *Juncus*-fringed, and exposure to wave action during windy periods is noticeable. Like the more easterly and upland Tindale Tarn, it is quite well aligned with the so-called 'Tyne Gap', the lowland corridor north of the Pennines widely regarded as an important migration route for birds. The tarn was formerly run by the County Council, and in 2006 its management was taken over by Carlisle City Council.

The notes that follow cover the years 2000-2010 and are the result of my frequent visits (at least twice a week or about 100 times a year) to count the waterfowl there, often before 10 am. Because of the large amount of data, I have included only my own observations. The records for 2001 are incomplete due to the Foot & Mouth Disease episode, although I still managed over 90 visits that year. There are also other gaps in the records, caused by my unavailability. Part of the reason for writing this account was the impression that some species were in serious decline: some clearly are, but in many cases it is more a question of cyclical 'ups and downs'. Although in my opinion, eleven years is not really long enough to demonstrate major changes in status, I do have records going back to 1968. The species discussed have all appeared with some degree of regularity, even if only in small numbers, over the period. Table 1 summarises the situation with six of the most significant species. At the end I have included brief details of the rarer species, those recorded only before 2000, and finally other wetland birds.

Great Crested Grebe – This species has undoubtedly declined recently, but has done so before during the period. In the early years of the review nineteen or twenty occurrences* were recorded annually. Records fell to single figures until a revival took place between 2005 and 2008, with a high of 22 in the latter year. In 2009 and 2010 very few were seen at all: the maximum number on any one visit was three.

* mention of 'occurrences' or 'sightings' means the species was present on the day of my visit.

Little Grebe – A similar pattern to Great Crested, with a decline between 2002 and 2004, a revival from 2005 to 2007, and a return to scarcity in the past three years with no sightings in 2010. 2007 had the highest number of occurrences with 36, and the maximum number recorded was seven in September 2006.

Cormorant – Fairly steady numbers until 2007 when a decrease took place and, as above, no records in 2010. Records per year varied from two to 18. Birds are usually seen in ones or twos, but an impressive group of 20 was seen one day in December 2005.

Mute Swan – Up to 2008 this species was somewhat irregular, occurring in moderate numbers and mostly in winter. There were up to 50 records per year. In 2008, a family was introduced from a site in Carlisle where there had been 'friction' between it and another family. The original pair has nested for the past two years. The maximum number recorded was 21 in February 2007.

Whooper Swan – A very scarce winter visitor with records in only 6 of the years in question. There was a maximum of 15 in October 2003.

Greylag Goose – Can be seen at any time, but usually passing over, often in small numbers. 2006 had the highest number of sightings with 26. Has bred locally but not within the site. A flock of 96 was present in September 2002.

Canada Goose – A regular visitor and rather more frequent than the previous species with a maximum of 39 occurrences in the same year as the Greylag maximum. The origin of these birds is unknown and they have never bred. Numbers vary from single figures to three figures with a maximum of 128 in October 2009.

Mallard – Until about 1994, Mallard were quite scarce at Talkin Tarn. Since then they have been an almost permanent fixture and various hybrids and domestic versions have become integrated. Several pairs breed annually and the maximum recorded was 350 during the 2010 hard winter.

Gadwall – Fairly regular in small numbers in winter, although less so during the last three years. Occurrences have been in the high twenties to low thirties. A maximum of nine birds was recorded in December 2000.

Shoveler – Quite a rare sight, usually occurring in pairs (never more) and at odd times. Only recorded on 14 occasions during the whole review period.

Wigeon – A regular winter visitor with declining numbers in recent years and with occasional out-of-season sightings. Usually seen on 40 or 50 visits per annum. A record maximum of 407 was counted in December 2001, but lately numbers have usually been below 100.

Teal – An unaccountably scarce visitor with only 75 records over the whole eleven-year period and only in 2003 did occurrences exceed double figures, with 17 in that year. Maxima of 22 birds were seen in September 2001 and October 2006.

Pochard – A species very much in decline since 2006 with only 19 records since then. Figures before 2006 were often in the twenties or thirties, with a maximum count of 29 in December 2001.

Tufted Duck – A common species throughout the year, but in small numbers in summer, and rarely breeding successfully. Highest counts have been 70 in December 2000 and 2007.

Goldeneye – A regular winter visitor in decreasing numbers (rarely more than five) until early 2011 when double figures were achieved, and a maximum of 27. Annual occurrences are in the thirties or forties with 56 in two years. The maximum count for period was also 27, in March 2002.

Smew – A fairly regular winter visitor in small numbers although not recorded in 2007 and 2008. The highest number of separate sightings in any one year has been eight, with a maximum number of four present in January 2003.

Goosander – A regular winter visitor, sometimes in large numbers but not so in recent years. The greatest number of sightings in a year was 45 in 2000, with the highest count, of 155, in January 2002. Recently, numbers have been below 50. This species breeds at nearby sites.

Red-breasted Merganser – A scarce visitor, bordering on rarity, since none have been seen since 2002. Recorded 15 times up to that year, with a maximum of three

birds in December 2000.

Ruddy Duck – Formerly a fairly regular visitor in small numbers in spring or autumn. The peak year for records was 2001 with 12 occurrences, but never more than two birds. Not recorded since 2008.

Moorhen – Before the review period Moorhens were a very unusual bird. Since 1999 they have been seen almost daily and breeding has taken place regularly. The maximum number recorded was 21 in January 2007; numbers usually are in low double figures.

Coot – Usually a winter visitor, but has bred occasionally and often present all year round. In recent years numbers have been below 100. There was a maximum count of 177 in November 2006.

Rarities

Slavonian Grebe – 1 seen in 2007.

Black-necked Grebe – two together in 2009.

Bewick's Swan – five birds briefly in 2006.

Black Swan – a single bird of this non-native species on a few occasions in 2006, 2009 and 2010.

Pink-footed Goose – Occasionally recorded, almost always passing over. Seven records during the period, and a maximum of *ca.* 200.

Barnacle Goose – In a few years, flocks arriving for winter on the Solway have been seen passing over, but during the review period only noted in 2003 and 2008. In 2003 a hybrid Barnacle Goose × Canada Goose (of one of the small races?) was present on four dates.

Snow Goose – A bird, presumably feral, was seen in 2006

Shelduck – One bird, seen once in 2002.

Pintail – A very scarce visitor. Only recorded six times during the review period. In spring 2002, a flock of 16 was present.

Red-crested Pochard – One bird was seen on nine occasions in 2006 – a probable escapee.

Scaup – Much scarcer during the current period than before 2000. Only recorded

on four occasions, with a maximum of three in 2005. Not seen since 2008.

Lesser Scaup – One bird, noted twice in 2003.

Common Scoter – As with Scaup, scarcer than before 2000. Only three occurrences during the review period. A maximum of two birds was in 2001, and it has not been recorded since 2006.

Long-tailed Duck – One stayed for quite a long period in 2009.

Muscovy Duck – A group (introduced or escapes?) was present between 1998 and 2003. Has bred on at least one occasion. A maximum of 11 was in 2001.

Species recorded only before 2000

Red-throated Diver; Red-necked Grebe; Ring-necked Duck; Eider Duck; Mandarin Duck; White-fronted Goose; Emperor Goose.

Other birds of wetland habitats

The list of waders recorded comprises Lapwing, Curlew, Snipe, Oystercatcher and sometimes Redshank and Common Sandpiper. I have recorded no others during the period. Gulls are mainly a winter feature with mostly Black-headed, Common and Lesser Black-backed Gulls. Herring Gulls are not infrequent but Great Black-backed are scarce. Again, I have recorded no others in the period. There was a Black Tern in September 2005, a Sandwich Tern in September 2002 and seven Common Terns one day in June 2004. Kingfishers have been seen on a few occasions.

Table 1. *Selected species, with maximum counts and month of count*

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Teal	4	22	8	8	4	6	22	11	4	9	16
	Oct	Sep	Oct	Oct	Nov	Nov	Oct	Oct	Feb	Jan	Sep
Wigeon	345	407	312	300	353	182	396	245	90	112	69
	Feb	Dec	Jan	Dec	Jan	Dec	Jan	Jan	Dec	Oct	Nov
Pochard	9	29	7	20	10	3	11	5	6	9	3
	Sep	Dec	Mar	Feb	Mar	Jan	Oct	Oct	Dec	Jan	Mar
Goldeneye	16	19	27	8	20	14	20	12	8	11	8
	Dec	Feb	Mar	Mar	Feb	Nov	Feb	Mar	Jan	Mar	Feb
Goosander	81	111	155	115	35	27	25	42	45	31	42
	Dec	Jan	Jan	Dec	Jan	Dec	Jan	Dec	Dec	Dec	Jan
Coot	165	81	135	99	41	24	177	152	58	90	56
	Feb	Oct	Jan	Feb	Jan	Nov	Nov	Jan	Dec	Dec	Nov

Discussion

As the table shows, maxima of Wigeon, Goosander and Coot occur exclusively during the winter months. Wigeon and Coot often feed together, mostly on floating vegetation (almost entirely Nuttall's Waterweed, *Elodea nuttallii*), the latter not regarded as a good thing by members of the rowing and sailing fraternities. Managers of the tarn have recently tried to minimise the amount of weed by physical removal. This may account for the fluctuation and recent smaller numbers of those two species. Goosander, however, feed on fish, which involves catching them under water, and waterweed may possibly tend to inhibit this activity. The decline in numbers after 2003 suggests Goosanders found easier fishing elsewhere.

The other species shown in the table (Teal, Pochard and Goldeneye) tend to show maximum numbers in spring or autumn, suggesting they use the tarn as a staging post on passage. Numbers of both Teal and Pochard have also declined a great deal recently, but there is now very recent evidence (from early 2011) that Goldeneye may be increasing again. Management changes have led to increases in recreational use of the tarn: such developments must have impacted on its wildlife interest and presumably will continue to do so.

That farmland surrounds the tarn on most sides is a further factor: its effects on water quality at times are dramatic, with occasional large-scale algal 'blooms' perhaps stimulated by enrichment of the water from fertiliser run-off. Coincidentally, grazing-land adjacent to the southeast margin of tarn is currently being planted into woodland, which will have an impact on nutrient inputs from those areas.

My visits in future years should reveal how the situation develops.

The Polecat in Cumbria

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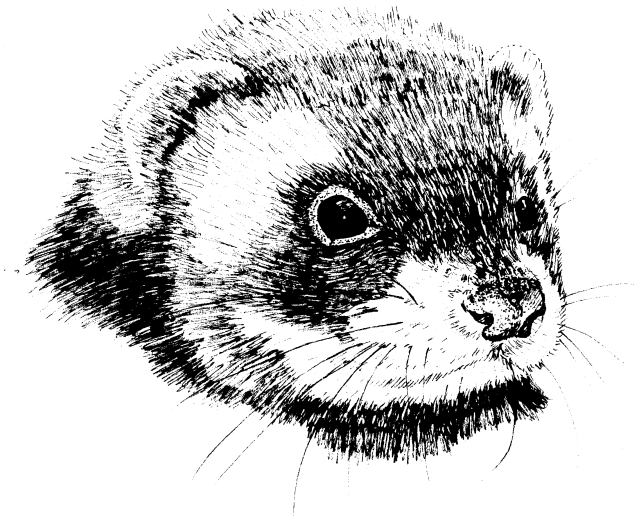
The history of the Polecat in Cumbria divides into two phases. The first was when the native population, which had been numerous and widespread, began, in the middle of the nineteenth century, a rapid decline leading practically to extinction in the early years of the twentieth. The second, which began around 1980, was the result of re-introduction.

In Cumbria the Polecat was known as the 'foul mart' or 'foumart' – names coined by hunting enthusiasts to distinguish their quarry from the 'sweet mart' or Pine Marten. J. Birks (pers. comm.) thinks it possibly derived from the defensive stink of the cornered or threatened animal. That a hunting tradition for Polecats was long established is clear from the appearance of the name in local areas, although it must be said that the name as mapped is not nearly as common as that referring to Pine Marten habitats. Nevertheless, Ritson Graham (1993), for example, records 'Foulmart Holes on the Butterburn' as 'an old haunt' which it may be noted connected the Polecat to a marshy area. This association with low ground and valleys is emphasised in Macpherson (1892) and is in keeping with the habitat description of the species in Birks & Kitchener (2008).

Whilst at its maximum numbers, the Polecat was very widely distributed in Cumbria 'from the mosses around Morecambe Bay to the wild wastes which march with the Debateable Land' (Macpherson *ibid.*). That its numbers were high until the middle of the nineteenth century can be seen from the following records of kills:

	Date	No. of Polecats	Source
<i>Kendal Parish</i>	1688-1705	1,150	Lovegrove (2007)
<i>Greystoke Manor</i>	1759	'a prodigious no.'	Wilson (1905)
<i>Kendal Parish</i>	1780-1800	1,149	Lovegrove (<i>ibid.</i>)
<i>Lowther Estates</i>	1819-1839	261	Graham (1839)

One nineteenth-century hunting enthusiast is estimated to have killed about 250 Polecats in 25 years and hunting continued until the middle of the 1870s (Macpherson, *ibid.*) when quarry scarcity limited the sport. Mitchell & Delap (1974) write, 'The districts near the Solway held such a population that it was customary for the handloom weavers of Carlisle to go off with a scratch pack of dogs at week-ends; they hunted 'foumarts' in the rough country and mossland not far from the city.'



Polecat: typical facial pattern

(Stephen Hewitt)

Obviously hunting was in itself a sport and pursued for its thrills: 'A Grand Fournart Hunt' is described in *The Westmorland Gazette* in 1845, but the Polecat had been persecuted since the Middle Ages for its destruction of poultry (Chaucer *ca.* 1390). Indeed Lovegrove (*ibid.*) says that *'throughout England and Wales Polecats were consistently persecuted at a greater intensity than any other species of mustelid'*, and this despite their valuable predation of rabbits and rats (Birks & Kitchener, *ibid.*). A further justification for the persecution was in the monetary value of the heads presented for payment as vermin to the parish vestries, some enumerated in detail in Macpherson (*ibid.*). Skins were also valuable, sold as 'fitches' into the furriers' trade. From as many as 600 offered for sale in Dumfries in 1832 numbers reduced rapidly until there were none available by 1870 (Lovegrove, *ibid.*).

Macpherson (*ibid.*) regarded what he calls 'the steel trap' – *i.e.* the gin trap – as the real cause of the Polecat's decline. Tapper (1992) describes the gin trap as the basic trap used by game-keepers over generations, and says its biggest single use was as a means of killing ground vermin. It was also widely used as a rabbit trap and as such would have been deadly for rabbit-hunting Polecats. In a footnote Macpherson notes that on Drigg Common *'five founmarts were trapped there on the first night that traps were set for rabbits'*. Certainly the Cumbrian Polecat population declined rapidly over a period of perhaps fifty years.

Langley & Yalden (1977) regarded the Polecat as extinct in Westmorland by

1910, and Yalden (1999) thought that by 1915 it survived only in the coastal strip of Cumberland. These dates are interestingly close to the date of the peak numbers of keepers in the National Census of gamekeepers in 1911 (Tapper, *ibid.*). The census reported the gamekeeper abundance figure for Cumbria as 4-8 per 10,000 hectares; by 1981 the comparable figure was less than 1.

There were, however, occasional subsequent records before its successful re-introduction. Pearsall & Pennington (1973) have one from 1922; Carlisle Natural History Society records show one from Orton Moss on the Solway plain in 1928. (Hewitt, 2010); Ritson Graham (*ibid.*) has four between 1933 and 1966 from north Cumbria. A small scale re-introduction attempt was made in Grizedale around 1969, when two specimens were introduced from the Riber Castle collection in Derbyshire (John Cubby, pers. comm.). Nevertheless, when Ken Walton appealed for evidence of Polecats in Cumbria in the late 1950s and early 1960s none was forthcoming (J. Birks, pers. comm.).

It can, of course, be assumed that this interim period saw repeated losses of ferrets which could easily have brought some confusion to the picture. While the albino form is distinctive, some ferrets retain the basic Polecat coloration but are in general lighter, and their coat often contains white hairs. These are known to ferreters as Polecat-ferrets. Although knowledgeable observers may distinguish these from Polecats (see Kitchener, 2002) a whole range of subtle variants in pelage is possible as the two 'species' and their hybrids are fully interfertile. Indeed it is now thought that *Mustela putorius*, the Polecat, and *Mustela furo*, the ferret, can be considered con-specific, and that differences in pelage, skull characteristics and behaviour are the result of more than two thousand years of domestication of the ferret, which has been specifically selected for tractability and visibility (see Birks & Kitchener *ibid.*).

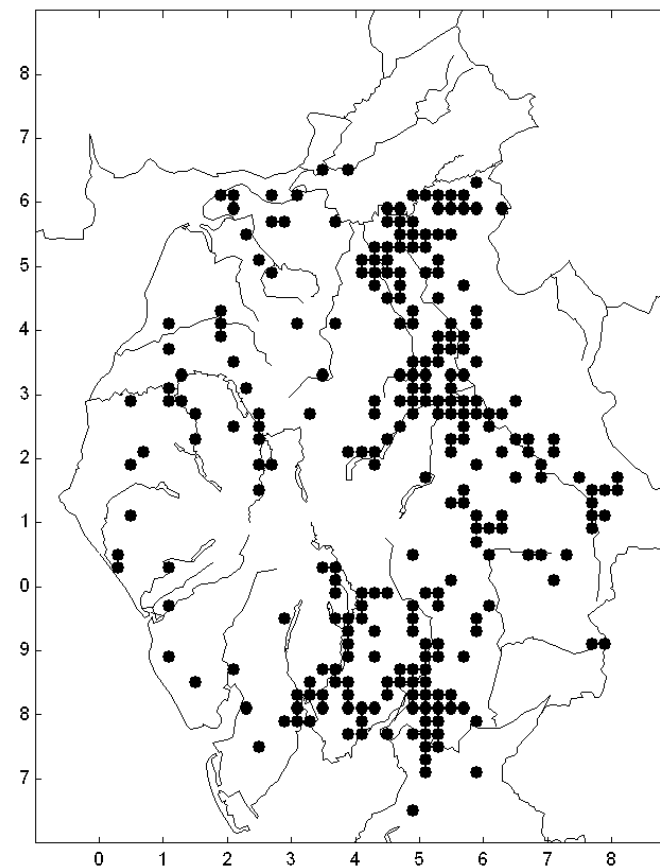
The re-introduction programme began in 1978 and the first releases were again made into Grizedale Forest, where up to twelve specimens were released at various times between 1978 and 1980 by Ken Stoddart with the approval of the then Forest Conservator, J. Chard (J. Cubby, pers. comm.). G. Russell Coope (in litt.) said that he heard of them or their progeny living there several years later. Jones (1992), who obtained his data from an un-named source (almost certainly Stoddart), claimed that the animals released in the first five years of the programme were *'80% Polecat hybrids'*, (which provides an explanation for some of the 'ferrety' features in the Cumbrian population), but that later releases were of pure Polecat stock. Jones added that over fifteen years his source had released up to 150 animals and estimated the then current Lake District population at around 1,000.

By the early 1980s the relict native Polecat population in Wales had spread naturally eastwards and into the West Midlands area. A detailed analysis of this spread is recorded in Birks & Kitchener (1999). The species was therefore appearing in the Welsh border counties where it may have been largely unknown in living memory although it has been suggested by Birks & Kitchener (2008) that the Polecat might never finally have become extinct in Shropshire and Herefordshire. Coope (in litt.) obtained some specimens (which he believed would otherwise have been destroyed) from these two counties and from them bred about fifty animals which he gave to Stoddart. It therefore seems likely that Stoddart's later releases of pure Polecats, which continued until 1998, originated from this source.

Coope sent me a full description of the animals he gave to Stoddart: *'The animals ... were all very dark,'* he writes *'and had no white at all on their chins. The head colour was very dark between the eyes and also in the cheek region. Their noses were also dark and this colour was joined to the rest of the head across the bridge of the nose. They would I am sure be accepted by Johnny Birks as genuine Polecats. They certainly behaved in a very wild manner (i.e. they could jump a metre or so and would bite at the slightest provocation).'* This description matches well the appearance of his last releases that Stoddart showed to me. They were very dark in colour and wild in behaviour giving an overall impression quite unlike that of Polecat-ferrets.

Stoddart's two main release sites were Sunbiggin Moor near Orton, and Simpson Ground east of Newby Bridge (pers. comm.). Coope (in litt.) said Stoddart also *'put a pair or two into rabbit holes at Tarn Hows where they lived for quite a while before moving off.'* Presumably both main sites had a large rabbit population, and both, though essentially open, contained scrub, wetland areas and a tarn. An additional factor which was important in the subsequent spread of the species was that both sites had close access into the river systems: Sunbiggin Moor into the Lune and Eden, and Simpson Ground into the Winster and Kent. It is almost certain that it was these systems that facilitated colonisation, for it can still be recognised in the latest distribution maps which additionally show even now an eastern and southern emphasis (see map opposite).

The first records of animals likely to have come from these release sites began in the early 1990s. One from 1993 is especially notable. It was of an animal trapped by a gamekeeper, Edwin Dargue, at Flakebridge in the Eden valley which, by virtue of its uniqueness, he had mounted. Soon after this they began to appear in mink traps set by Raymond Clark, a National Rivers Authority bailiff on the Eden. The majority of records, however, because of the nocturnality of the species, were road casualties, and as soon as records began to be mapped the speed of re-



Map 1. Post-1979 Polecat records for Cumbria (Cumbria Biodiversity Data Centre, Tullie House Museum)

colonisation was evident. Clearly a niche was readily available for the Polecat to fill. A series of maps published in this journal (Lurtz, *et al.*, 2005) showing the expansion in the range of the Polecat between 1985 and 2004 illustrates very clearly that the range had been largely established by 1994, and by September 1995 a Polecat was recorded in Lancashire. These maps also show the increase in the number of records as Polecats became more common. As numbers increased, some interesting records followed. A dog in the Lune valley near Gaisgill caught a Polecat in a roadside ditch and emerged shaking it vigorously; the Polecat emitted such a smell and explosive chattering scream that the dog dropped it and it escaped. Julie Stebbings (pers. comm.) at Newby near Morland on June 11th 2003

watched through binoculars a female Polecat moving seven young in daylight mobbed by Jackdaws and Rooks. She described the young as seven to eight inches long and pale underneath.

Before looking at the question of numbers, it is worth noting that Andrew Kitchener (pers. comm.) said that by September 1995 he had not seen what he called a 'non-ferrety' Cumbrian specimen. He refused to accept as a 'pure' Polecat any example showing an extension throat-wards of the white chin. Poole (1970), however, says that '*Polecats frequently have small patches of white on the chin and chest*' and in fact by 1999 Kitchener was recognizing the possible presence of a short throat patch in the Polecat phenotype (Birks & Kitchener, 1999). In my records I note that I described the Lancashire specimen above as '*very good but slight flaring onto neck of lower jaw patch*'.

As part of a national survey to look at the recovery of the Polecat in Britain, the Vincent Wildlife Trust began a Polecat live-trapping programme in 1994 under licence from English Nature. As part of that programme, six one-kilometre-squares were 'trapped' in Cumbria over the winter of 1994 and the spring of 1995. Each square was divided into a grid of 16 smaller squares and a trap placed in each for seven consecutive nights – a standard methodology allowing comparisons to be made between areas. Unfortunately squares near Sedbergh, Lanercost, Lindale and Lakeside recorded no captures during that week despite Lindale being very close to Simpson Ground and to a road casualty site, and Sedbergh being close to the Lune valley (which had been the likely route for movement into Kirkby Lonsdale and Lancashire). Two squares in the Eden valley, one south of Temple Sowerby and one south-west of Brough showed good returns however: in both, four different males were trapped in the one-kilometre-square. The lower valley site, near Temple Sowerby, was especially interesting as the square contained an apparently resident male which was trapped every night of the week and in six different traps. This was unusual for the survey and might suggest a 'trap-happiness' related to 'ferrety' genetics (Birks & Kitchener, 1999). In all, here, four males provided ten captures – a figure of 9.7 per 100 trap-nights – a density comparable to that of the best Welsh sites (J. Birks, in litt.).

Ten years later, from 2004 to 2006, in conjunction with the Mammal Society, the Vincent Wildlife Trust again looked at the national picture in a survey based mainly on road casualties. Here the project was also to look at the 'purity' of the Polecat stock and determine which animals still had 'ferrety' features. Nationally the results were very encouraging indicating a continuing spread of the species eastwards and southwards from Wales. The 'ferrety' specimens occurred mainly near the edge of the distribution. Cumbria showed evidence of good Polecat examples especially in the eastern half of the county, although even here, as well

as towards the west, there were some animals showing signs of 'ferrety' pelage. The survey recorded a total of 48 specimens from Cumbria and of these 35 (72.9%) were classed as true Polecats and 13 as Polecat-ferrets. Of this latter group 10 (76.9%) were noted as 'dark' (Birks, 2008). The report also suggests a difference in survival and/or reproduction in favour of the Polecat form in the wild. This fits well with Hewitt's (2010) conclusions that '*increasingly the physical characteristics of the wild species have come to dominate*'.

Although this question of 'purity' might be considered mainly a concern for the taxonomists, or indeed hardly at all now that the conspecificity of the species has been established, there is still an interest in how 'ferrety' features persist or are incorporated, particularly as the loss of ferrets into the wild will continue. Nevertheless J. Birks (pers. comm.) concludes that we can be optimistic about the future of the Polecat in Cumbria. Although he suggests that only true phenotype animals might receive protection under Schedule 6 of the Wildlife and Countryside Act 1981, from a practical and conservationist point of view it is reasonable to regard all our Cumbrian specimens as Polecats. The map below shows the 2010 distribution of the species. As the records are largely those from road casualties, results are missing from those areas lacking fast, main roads and/or observers. It should therefore be regarded as a minimum distribution.

Acknowledgements

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Northern Deergrass (*Trichophorum cespitosum* (L.) Hartm.), new to Cumbria, with comments on its habitats

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Introduction

'Deergrass' will be familiar to all who walk over peat-mosses and other peaty soils – those dense and very firm tussocks, with masses of splaying 'leafless' slender wiry stems with small brown heads – often providing firm footing when crossing boggy ground.

The presence of three taxa of deergrass in UK was elucidated as recently as 1999 by Prof G.A. Swan from work in Northumberland (Swan, 1999). He confirmed the presence of two subspecies (more recently regarded as full species) and their sterile hybrid. Following promotion to species, the familiar widespread deergrass, previously known to British naturalists as *T. cespitosum* or *Scirpus cespitosus*, must now be called *T. germanicum*. Its vernacular name is simply 'Deergrass' (e.g. in Jermy *et al.*, 2007). However, without clarification this term can refer both to this one species, and to the group-name for the genus. I have made a case for it to be referred to as 'Common' Deergrass to reduce ambiguity (Roberts, 2009a), and it is so-called in this paper.

The name *Trichophorum cespitosum* is now retained for the rarer of the two species in UK (but the only deergrass in central Europe), the 'Northern Deergrass' of Jermy (2007). Prof Swan located just four sites for this in Northumberland – the only sites in England. Since 1999 the known distribution has been extended somewhat, by re-examination of herbarium specimens, and from recent fieldwork, to show very scattered sites in 19 vice-counties in upland Britain (see National Biodiversity Network Gateway map: URL at the end of this paper).

From Swan's work we now know that the sterile hybrid between the two, *T. ×foersteri*, is far more widespread than is its rarer parent. In Northumberland Swan found the hybrid to be almost ubiquitous in the uplands (again, see the National Biodiversity Network Gateway map), and it might prove to be equally abundant in many upland areas throughout Britain if it was to be thoroughly surveyed.

Habitats in previously-known sites northern England and Scotland

In a recent article in *The Carlisle Naturalist* (Roberts, 2009b) I described the finding (on a Carlisle Natural History Society outing) of the Northern Deergrass in a calcareous flushed area on Widdybank Pasture, Teesdale, new to v.c. 66 (Durham). The plant was growing with many of the famous 'arctic-alpine relicts'

of that area (*i.e.* plants typical of today's arctic and alpine regions, early colonists after the retreat of the glaciers, but now 'left behind' in very limited areas where unusual circumstances have allowed them to persist to the present).

From its habitat in Teesdale, and in a few places in Scotland with similar habitats, the Northern Deergrass would appear to fit comfortably into the community of arctic-alpine relicts. On 24th July 2010 Stephen Hewitt and I visited one of these Scottish sites, Glen Fender Meadows near Blair Atholl, where a remarkably similar suite of species to Teesdale occurs with abundant Northern Deergrass in calcareous flushes at 330 metres a.s.l.

However, the only other northern English localities – the original four sites discovered in Northumberland (Swan, 1999) – were in less distinctive seepage areas. On 4th August my wife and I visited two of these known sites.

At Blackheugh End, north of Bellingham, in a rather unprepossessing blanket-bog plateau, there was a wide flushed area in which the Northern Deergrass grew abundantly in a delightfully compact form, with a range of sedge species – Tawny, Carnation, Flea, Bottle and Yellow (*Carex hostiana*, *panicea*, *pulicaris*, *rostrata*, *viridula* ssp. *oedocarpa*), Few-flowered Spikerush (*Eleocharis quinqueflora*), an abundance of the very local Broad-leaved Cottongrass (*Eriophorum latifolium*), and a variety of other plants such as Butterwort (*Pinguicula vulgaris*) and Cranberry (*Vaccinium oxycoccus*). This was a remarkable diversity for what appeared to be a less-than-promising area, and must reflect some calcareous substrate below.

At Muckle Moss, a National Nature Reserve valley mire close to Grindon Loch and the Roman Wall, we found the plant sparsely along a short stretch of runnel and nearby seepages in a small area indicating some slight mineral enrichment. Plants such as Flea Sedge (*Carex pulicaris*) were associated with the deergrass here, but closely surrounded by typical acid peat species such as Heather (*Calluna vulgaris*) and Cross-leaved Heath (*Erica tetralix*). There were also many more plants of the deergrass hybrid.

Whilst casting about for the deergrass at Muckle Moss, Margaret ventured out some distance onto the quaking bog and found some plants of Northern Deergrass with only four associates, Heather, Cross-leaved Heath, and the two cottongrasses, Common and Hare's-tail (*Eriophorum angustifolium* and *E. vaginatum*). It was a great surprise to see the plant in apparently 'stagnant' peat conditions: it suggested that the search for the species must be widened greatly to include very different habitats from the 'arctic-alpine relict' types described above.

The plant in Cumbria, v.c. 70

All this 'preparatory work' was by way of familiarisation and a precursor to tackling a question, now become imperative: where in Cumbria might the

Northern Deergrass be lurking, hitherto unrecorded?

There are a few places in the county reminiscent of the 'hummock-and-flush' habitats of Teesdale, as at Crosby Gill and Orton Pasture, where some of the arctic-alpine relict plants, such as the Alpine Bartsia (*Bartsia alpina*), do occur. These areas, and others such as the superb mire communities at Tarn Sike, Sunbiggin, had been carefully searched for the plant in 2008 and 2009 without success. But perhaps the Cumbrian Border Mires, more similar to the known Northumberland sites, might hold the plant? The least-damaged, and most extensive by far, of such sites, is Butterburn Flow above Gilsland.

David Clarke and I visited Butterburn Flow on 11th August 2010. I had in mind the western lobe of the Flow, where the uniform mire surface starts to slope down to the west into a series of seepages and runnels, and conveniently close to the road which loops around the edge of the mire at this point.

Even from the road, huge sheets of deergrass were apparent, already turning a rich brown. These were soon revealed to be the hybrid deergrass, which is abundant all over the Flow, and indeed is locally the dominant plant. At this stage of the season, the total sterility of the hybrid was evident in the bare tops of the stems – the aborted fruits and the glumes having largely fallen.

On examining the seepage areas and the edges of the runnels, it was very satisfying to find many deergrass plants which were carrying heads of a few tiny blackish ripe nutlets: clearly therefore not the hybrid (see Plate 6). The small number of nutlets per head and their colour, the small size of the tufts, the 'wispy' and flexuous stems, and finally the 45° angle of the opening of the upper leaf-sheath (rather than steeply oblique) all pointed to Northern Deergrass, as did later microscope examination of the stem cross-sections. The BSBI referee of this genus, Michael Braithwaite, kindly confirmed the identification from samples supplied.

David and I mapped the occurrence around the head of the seepage zone using GPS, finding the plant almost everywhere. The densest populations found were at NY6593.7604 and for about 75 metres eastwards along the south side of the main eroding runnel. Towards the head of the seepages, where (as we knew from previous visits) there are patches of two localised sedges, the Few-flowered and Tall Bog Sedges (*Carex pauciflora* and *C. magellanica*), we were still finding the Northern Deergrass, here around sphagnum-filled hollows and seepages of acidic water.

Later, I made a further circuit of over three kilometres across the main western section of Butterburn Flow, marking the Northern Deergrass at many points, again with a vastly greater abundance of the hybrid. In a few places on the open mire surface the plant occurred in the absence of the hybrid (see Plate 7).

Importing the GPS waypoints together with the tracklog onto a Google Earth

aerial view (Plate 8) shows very clearly how the plants were most frequent on the darkest areas of the aerial view, which coincide with the most 'natural' and least disturbed parts of the bog.

Population estimate

Given that 225 actual sub-populations were 'waypointed' by GPS, each one representing at least one plant of Northern Deergass and many referring to more than one, several hundred plants were encountered on the tiny proportion of the mire actually explored. Making a few assumptions, we can give a crude estimate of the total population. It seems reasonable to suppose that the plant would prove to be as frequent on the so-far-unexplored eastern extent of the mire, the vegetation of which appears identical on the aerial view. As can be seen from Plate 8, the track covered both productive and less-productive areas of the Flow. Using online area-estimation utilities, such as those at the Zonum Solutions website (see URL at the end of this paper), Butterburn Flow has an approximate area of 3.6 km² (a figure which again covers both productive and less-productive areas).

The GPS meter gave the length of the tracklog for the search as 4.96 km. If the total width of the search area is taken to be perhaps one metre each side of the actual track, then the total area surveyed that day would approach 10,000 m² or 0.01 km². This suggests a minimum population figure of 81,000. On that basis, Butterburn Flow is by far the largest population of this species yet uncovered in England, and probably in the UK.

Locating and identifying Northern Deergass

At least if the plant is kept in mind, Northern Deergass is easy enough to detect when its fruits are ripe – i.e. for a few weeks from mid-July into September – with its heads of a very few (often only two to four) minute nutlets, which look shiny and blackish in the field – actually dark brown. (The ripe heads are however very inconspicuous against a background of plant stems. Cupping a mass of stems against a hand, or white paper as in Plate 6, will help to throw them into relief.) In contrast, the hybrid carries no ripened fruits and its heads are simply bare spikes by this stage. The Common Deergass is a more robust plant, with stems thicker, straighter and less 'wispy', and its heads carry more nutlets (mostly eight or more) which when ripe are paler brown and often dull rather than shiny.

Only two fruiting plants of Common Deergass were spotted on the day, both on the drier edge of the mire, although many sterile plants may have been missed. (It is worth bearing in mind that both parent species may fail to ripen fruits, so that where the hybrid is abundant, as at Butterburn, plants of either species which have aborted their fruits are easy to overlook as hybrids. A few sterile plants of both

species were in fact located.) Such plants can still be identified by stem cross-section examination, but this requires some dedication in collection and preparation of samples, and the use of a microscope. It is so much easier to search for the fruiting plants during this rather small 'window' of the late season! Microscopic examination should be employed in any dubious cases – see the website (URL below), and Roberts (2009b) and Jermy *et al.* (2007) for details.

Discussion

The unexpected abundance of Northern Deergass in blanket mire, albeit at a relatively undisturbed, if not pristine, site, opens up a whole new set of possibilities, and recorders need to keep the plant in mind when exploring mires in the north Pennines, and perhaps in the Lake District too.

Given its tufted growth form with only rather limited lateral spread rates, and its inability to colonise from seed, the abundance and extent of the hybrid in comparison with the parent species, at Butterburn and elsewhere, is a puzzle. It has been suggested that the anatomical differences between the two species might throw light on the differences in their range, distribution, and habitat preference. Common Deergass has air-channels within the green tissue running the full length of the stem, and these may perhaps enable gaseous-exchange between the atmosphere and their roots, immersed in stagnant deoxygenated water in the peat. Northern Deergass completely lacks these channels, and it is tempting to suppose that this may be one feature which serves to restrict the plant to habitats where water-flows bathe the roots, which could therefore exchange respiration gases directly with the water.

The hybrid is intermediate in this feature, having discontinuous air-filled cavities within the green tissue, which might still allow it to spread on peat substrates too extreme for Northern Deergass. At Butterburn most Northern Deergass plants do grow by or in seepage areas, whilst the hybrid also occurs out on the stagnant mire surface. Yet some plants of the former, as also at Muckle Moss, also survive in situations apparently stagnant and acidic.

Could Butterburn Flow – reputed to be the least-damaged of the Border Mires – itself be regarded as a 'relict' habitat, one which has allowed the persistence of Northern Deergass in sub-optimal habitat? The almost universal tampering by humans with blanket bogs over a very long period could have encouraged the hybrid to consolidate its hold by disturbing the peat surface and physically dispersing plants. Once spread, its possible 'hybrid vigour' could have caused it to out-compete and hence widely eliminate Northern Deergass.

On a rather different tack, and given the usual spacial separation of the two species, it is also tempting to suppose that the actual hybridisation event, or events, took place a very long time ago – thus allowing ample time for the slow spread of the

hybrid to its present extent. Before the development of smothering peat in the Post-glacial epoch, the Late-glacial landscape would still provide abundant mineral-rich seepages and marshes. Northern Deergrass would be likely to occur in mires of several different types, as it is today for instance in Switzerland (pers. obs.), in the absence of both Common Deergrass and its hybrid. As peat encroached on these mineral-rich mires, the Common Deergrass would follow, the two species would meet, and hybridisation likely occur. The Northern Deergrass, more demanding of minerals and of oxygen, would then gradually become limited to a limited set of habitats by both edaphic requirements and competition.

Further exploration may detect the Northern Deergrass in other Border Mires and elsewhere, and it would be very instructive to examine more closely the precise edaphic conditions where the Northern Deergrass and the hybrid occur. The water-flows over, and from, Butterburn Flow appear 'ombrogenous' – i.e. derived from rainfall. It remains to be seen how much oxygen does penetrate to the level of deergrass roots, and whether there is some seepage from substrates below the peat – just enough to satisfy the requirements of the Northern Deergrass. It is intended to address these questions in future seasons.

Acknowledgements

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Websites

Author's deergrass website: www.edencroft2.demon.co.uk
NBN Gateway maps: www.searchnbn.net/ (then use the search field for the taxa – listed as subspecies)
Zonum Solutions: <http://www.zonums.com/gmaps/maptool.php>

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The *Carlisle Naturalist* publishes material on all aspects of the natural history of Cumbria. General articles, results of personal research, news items, records and letters of relevance to Cumbrian naturalists are welcomed. Material accepted for publication must not be submitted in a similar form to any other journal.

Material should be clearly legible – if type-written, then double-spaced on one side of white A4 paper. Material by post should be sent to David Clarke, Burnfoot, Cumwhitton, Brampton, Cumbria CA8 9EX.

Computer files should be in rich text format or Microsoft Word and e-mailed to david.clarke19@virgin.net, or submitted on CD/DVD accompanied by a paper copy. Authority names should be given in full.

References should be given in full at the end of the article or note.

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Summer Field Meetings & Workshops 2011

(Saturdays except where stated. Depart from Carlisle College, Victoria Place, Carlisle.)

11th May (Wednesday): Cardew Mires, birds, etc.

Leader: Frank Mawby. Depart 6.30 pm. Meet at Cardew Mires Tarmac Quarry car-park (NY348.509) at 7.00 pm.

28th May: Braithwaite Moss, insects

Leader: Stephen Hewitt. Depart 9.30 am. Meet layby on A66 westbound (NY229.252) 10.30 am.

11th June: Cliburn Moss NNR & Tarn Moss NNR

Leader: Frank Mawby. Depart 9.30 am. Meet Cliburn Moss (NY573.258) at 10.30 am.

9th July: South Lakes, dragonflies, etc.

Leader: David Clarke. Depart 9.30 am. Meet at Foulshaw Moss (SD458.838) at 11.00 am.
Check weather prospects with David 01228-560117 on Friday evening if in doubt.

23rd July: Drumburgh Moss CWT Reserve

Leader: Geoff Naylor. Depart 9.30 am. Meet roadside pull-off E of Drumburgh village at NY269.597 at 10.00 am.

30th July: workshop: Soldier Beetles

Leader: Jim Thomas. Meet Tullie House 10.00 am. Field trip in the afternoon. Lunch not provided. Please book in advance with the Tullie House Box Office (01228 618700).

6th August: Border Marsh, saltmarsh

Leader: Frank Mawby. Depart 9.30 am. Meet Border Marsh gate (NY166.541) at 10.00 am.

20th August: Wan Fell

Leader: Stephen Hewitt. Depart 9.30 am. Meet entrance to Brownrigg Quarry (NY515373) 10.30 am.

26th August (Friday evening): Moth-trapping at Finglandrigg NNR

Leaders: Mike Clementson & Liz Still. Depart 8.15 pm. Meet at (NY281.571) at 8.45 pm.

10th September: Borrowdale, mosses and liverworts

Leader: Jeremy Roberts. Depart 9.30 am. Meet Great Wood National Trust (pay-and-display) car-park, NY271.214, 10.30 am.