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**Next issues: deadlines for final copy**

**1st September 2015 & 1st March 2016**

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**Cover:** Male Dotterel performing 'distraction display' at a nest with three eggs in the Buttermere fells, 1978. © *John Callion*. [scanned from original print]

## Wildlife Reports – September 2014 to February 2015

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*The following is a selective extract from the many interesting reports received since the previous issue. All records form part of computerised data, traceable to named recorders, held by Cumbria Biodiversity Data Centre at Tullie House Museum. Uncredited records are usually my own.*

September was one of the driest on record with only 10% of the average rainfall. It was also the second warmest, with 2006 being warmer. It was followed by the wettest October on record with 96 mm on 3 October. The whole month was very mild and unsettled. November and December continued mild and changeable although rainfall was above average for December. With 1006 mm of rain, 2014 received above average rainfall. (The Solway plain average is 900 mm.) January began mild but turned colder with some snow and rainfall above average. February began dry and cool but then turned changeable although rainfall was below average. (Drumburgh weather observations by Tony Matthews.)

The dry September was ideal for butterflies and other insects and prominent amongst the records are numerous **Red Admiral** sightings (JI, GH, RG, BW); around a dozen were in DC's Cumwhitton garden for almost two weeks from late September. The last noted was 18 November at Heads Nook (AAr). **Speckled Wood** also featured regularly: as at Burgh-by-Sands on 17 September (SG), Bowness NR 5 September and Blackmoss Pool 11 September (both BW). A 'first ever' at Cumwhitton was on 11 September, which also produced the latest date – 12 October (DC). A total of 29 records was received by CBDC. The Centre also received nine records for **Comma**. DC at Cumwhitton recorded his highest ever count of five on 2 October, with a late record on 3 November. Several **Small Copper** records were received during September: from Cumwhitton (DC), Croglin (GH), Carlisle (JR) and Watchtree – 3 – (LS), with the final record from MW on 7 October at Crofton. **Small Tortoiseshell** also featured well, with eleven records in September (C&AR, GHe, JC, LG, MR), four in October (MW, GHe, and JC) and a late one on 22 November from JR at Hensingham. **Wall Brown** records came from MW, PH, TM in September, plus one by TF on 13 October in Rickerby Park, Carlisle. **Painted Lady** were scarce this autumn with only six records, three of which came from HB in her garden near West Hall, Brampton, 3 to 6 September, with last records on 20 September at Watchtree and 24 September at Burgh-by-Sands (RG). A single **Clouded Yellow** was seen by MR on Arnside Knott on 8 September. MR also recorded a **Brimstone** at Latterbarrow on 5 September. Late second broods of **Common Blue** were recorded by JC on 7 September at Oldside, Workington; at Watchtree there were four records between 5 and 24 September (LS); MR noted them at Sandscale Haws on 3 September. **Large, Small and Green-veined White** were all recorded into mid-October. The only records for **Humming-bird Hawk-moth** once again came from DC in his Cumwhitton garden – here seen briefly on 30 September and 7 October.

## *Birds*

**Whooper Swans** were quite elusive in the autumn although a flock of 130 to 150 was seen regularly in October near Calvo feeding on oil seed rape, which seems to be a new food source for them, much to the chagrin of the farmers. They settled onto more regular sites around Kirkbride, Grinsdale, Longtown and Walby and on the 18 January, the annual census date, a total of 396 was recorded, the largest flock being 128 by MA near Whitrigglees. **Pink-footed Geese** arrived on cue, first seen on 7 September. Some 6000 were present for most of the autumn, with the usual northward movement in early February with over 16,000 flighting off the Wedholme roost at dawn on 23 February. Over half had gone north by the end of the week. Records of other species of geese were scarce, with a single **Brent Goose** with **Barnacles** on 28 November on Newton Marsh by Anthorn (JI). Large numbers of **Barnacle Geese** are now such a regular feature of the Moricambe Bay marshes that they go largely unrecorded. **Gadwall** are turning up quite frequently at Watchtree. We had 10 on 1 February, and 21 were on Sunbiggin Tarn on 20 September (BR). **Smew** turn up in most winters and on 3 February a 'redhead' was seen by DJ on the Eden near Park Broom where on the 6 February I had a brief glimpse of it with 20 **Goldeneye**. A **Mandarin Duck** was on Cardew Mires on 2 November (TMe). **Goosander** are featuring more often nowadays and a pair were competing for bread with Black-headed Gulls and Mallards on Hammonds Pond, Carlisle on 3 January (T&JB), and 8 were recorded by the suspension bridge over the Eden in Rickerby Park on 4 February (HS).

It is good to note that higher numbers of **Black Grouse** are now being reported, with 35 at Garrigill on 15 October (JT) and 20 plus at Hartside on 24 January (SH). **Grey Partridge** records remain relatively scarce with 2 reports from DJ: a covey of 8 at Biglands Farm, Bowness on Solway on 10 November and a pair at Blackford on 14 February; we were delighted to see a covey of 11 in the field opposite our house in Kirkbride on 20 January.

Raptor records regularly feature **Merlin** and **Peregrine** these days. **Red Kite** are still rarely seen although BR noted two from the Orton area on 28 September and 24 December. **Goshawk** is another rarely seen bird and JT did well to find a pair hunting Lazonby Fell on 28 October. The same is unfortunately true for the **Hen Harrier**, although a male was seen regularly during the autumn hunting Bowness Common.

A very late **Common Sandpiper** was at Glasson Point on 10 November (CA), whilst a **Little Stint** was at Bowness Railings on 2 January (DJ). A **Greenshank** was at Grinsdale on 12 February (DoS) and a Green Sandpiper was seen several times at the Walby flash in February (CA). I thought **Snipe** numbers were a little bit down this winter but had **Jack Snipe** on Border Marsh on 8 November and at Southerfield on 28 November; one at Port Carlisle was on 9 November (JI).

Of other coastal birds, 800 **Cormorant** at Workington Dock in October was an

exceptional number (JC). Coastal **Little Egret** records are now common, but an interesting aspect of this species are occurrences well away from the estuary, as with one at Wreay on 1 January (C&AR) and another at Dalston on 14 February (AA). The **Bittern(s)** at Siddick seem to be regularly obliging birders nowadays, including giving R&JA fabulous view perched on reeds on 4 January.

Amongst owls, **Long-eared Owl** records are quite scarce, but this is a very much under-recorded species. It was good to receive a remarkable record of 6 from TW at Shap Wells on 2 November. **Short-eared Owl** records were also few, but a number showed well at Binsey for several days in January (MP), and GHe had one at Shap Summit on 26 December. Considering the very good breeding season, **Barn Owl** records were few in the autumn, with one at High Heskett (HK) in late November. It was the New Year before observers began to notice them at Inglewood Bank on 25 December (C&AR), Welton on 21 January (AA), Barrock Fell 8 February and Thieveside Cottage (HK), Hallbankgate, Toppin Castle, Hayton (GHe & LM). **Little Owls** are especially territorial, as noted by MP with a pair he regularly saw near Wigton in January, as did RS near Longtown on 28 February.

Of interest amongst passerines, a very late **Wheatear** was seen by JC at Grune Point on 29 October. Whilst common on the coast, wintering **Stonechats** are being recorded more often inland and DJ saw 2 near Boustead Hill on 5 January. Three departing **Ring Ouzels** were seen near Pink Quarry, Shap on 29 October by TW, where he also saw some in the spring; NG reported them from Gateside on 2 and 16 October. Incoming thrushes, **Redwing** and **Fieldfare**, were being reported regularly from early October, with an exceptional record of 600 plus near Orton on 31 October (BR). A **Black Redstart** at Carlisle Airport (DJ & NF) was present from late November into February, often seen on the old Vulcan at the air museum (plate 1). **Siskin** and **Lesser Redpoll** were notably scarce this winter, bringing comments from several observers. One explanation proffered has been a bumper crop of cones on Sitka Spruce. DJ had a mixed flock feeding on Alder cones near Longtown on 30 January. The regular flock of **Twite** were on Border/Calvo Marsh in early November but the largest flock I saw was *ca.* 150. They spread out a little and NF saw 25 at Anthorn on 11 November and JI had a small flock on Bowness Common on 30 January. A very large flock of **Yellow Hammer** (50+) was feeding on a wild bird food crop on Red Hall Farm, Wigton, in December with an equally large flock of **Tree Sparrows** and at least 150 **Linnets**. **Tree Sparrows** were not common 20 years ago but wild bird food crops and garden feeding has given them a real boost. It is my feeling that **Linnets** had a poor breeding season hence the relatively small flock at Red Hall. **Snow Buntings** were seen on the top of Bowscale Fell on 30 November (TT). At sea level two were on Grune Point on 7 December (JI & NF); whilst TR reported 10 on Blease Fell, Howgills on 26 January. A **Great Grey Shrike** at Dalton Crag, Hutton Roof, was seen by DJ on 23 November. **Willow Tits** remain scarce and rarely reported and I was fortunate

to find two in Finglandrigg Wood with a tit flock on 18 February. **Raven** is well reported, with a remarkable record of 15 from near Hayton Gate on 29 December (MG). The Watchtree **Starling** murmuration built up to some 20,000 birds, roosting in the reeds in front of the hide but moved on soon after the first frosts, perhaps joining the flock at Portland Square in Carlisle – which remained there until the end of February.

Amongst under-recorded species, a **Water Rail** was seen at Watchtree during the Starling roost watches; **Woodcock** is also often overlooked, but the most unusual record was from JI near a roundabout on the new Carlisle bypass on 21 November.

### *Mammals*

With the huge national decline, sightings of **Hedgehog** are increasingly worth noting; these included a road casualty at Durdar on 12 November (SH) and two live on 29 November from Plumpton (GB) and Great Broughton (AM). **Red Squirrel** produced a welcome spread of records, especially from periods when this species spends time on the ground: 30 September, Ashness Wood (R&SG); 5 October, Eden Lacy (DC); 8 October, Mungrisdale (SD); 17 October, Harris Park, Cockermouth (DI); 31 October, Argill NR (DC); 'Oasis' near Cliburn Moss NNR (MS) 23 October; two from the Cliburn NNR, on 2 and 11 October 8 (CA); Finglandrigg Wood, October; near Skirwith, November (DS); a road casualty at Hutton-in-the-Forest, 12 Nov (SH); 20 December, Dalston (DH). It would be good to think that Grey Squirrel control measures are improving the lot of this beleaguered mammal.

### *Recorders*

MA Mike Abbs; AA Anne Abbs; AAr Alan Armsby; R&JA Roy & Jane Atkins; CA Colin Auld; GB Glen Bryson; T&JB Trevor and Joan Baxter; HB Helen Brown; JC John Callion; DC David Clarke; R&SD Richard and Sue Dixon; SD Steve Doyle; NF Nick Franklin; TF Teresa Frost; MG Mike Gardner; LG Lynette Gilligan; NG Nigel Gilligan; RG&SG Russell and Sara Gomm; SG Sam Griffin; GHe Gary Hedges; SH Steve Hewitt; DH, David Hickson; GH Geoff Horne; PH Peter Howard; JI John Ireland; DI Dorothy Iveson; DJ David Johnston; HK Harry Kay; AM Alex Mawby; SM, Shelagh Mawby; LM Lucy Merry; TMe Trevor Merrington; TM Terry Middleton; MP Mike Porter; BR Brian Redhead; JR John Read; TR Tristan Reid; MR Maureen Richardson; C&AR Craig & Ann Robinson; MS, Marie Saag; DoS Donna Salter; RS, Rob Shaw; DS David Singleton; HS Helen Spencer; LS Liz Still; TT Tony Tipling; JT John Turner; MW Michael Williams; TW Tony Williams; BW Bob Wright.

*Frank Mawby*

### **Hibernating Common Lizards (*Zootoca (Lacerta) vivipara*)**

While exploring near the Haweswater Dam (NY51) in mid-November 2014, Wendy was surprised to find three hibernating Common Lizards in a slight depression beneath one corner of a sheet of discarded plywood. Although in ‘soil’ or detritus, this was actually a layer only roughly 3 cm in depth on top of a tarmac-type surface. The sheet (*ca.* 18 mm thick) was replaced and the location checked about one month later, and again on 28 January 2015 when it was photographed (plate 2). What were apparently the same three lizards were present on each occasion but we were surprised to note that their body positions changed between visits; on the second visit the two larger animals were stretched rather than curled. The movement involved in changing position may have helped to shape the depression in which they lay. We also thought it interesting that the feet and toes were splayed rather than curled or tucked in. During the two month period the location had been subjected to periods of snow-cover and temperatures to about -7°C, but the lizards appeared to be unaffected and survived at least into February. Most reference sources seem to agree that Common Lizards typically hibernate underground and while this site was under cover it would not appear to offer the sort of protection implied by ‘underground’.

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### **Kemp’s Ridley sea turtle (*Lepidochelys kempii* Garman, 1880): stranding on Walney Island, South Cumbria**

On 20th December 2014, a dinner-plate sized live ‘cold-stunned’ sea turtle was found washed up in a rock pool on West Shore Beach, Walney Island (SD170700) by two members of the public. The turtle was transferred to the Lake District Coast Aquarium in Maryport by rescuer John Watson and Sarah Neil (Cumbria Co-ordinator for British Divers Marine Life Rescue) for intensive care by specialist vet Vicki Temple (plate 3). The specimen was identified by Rod Penrose (Cetacean Strandings Investigation Program) as a juvenile Kemp’s Ridley *Lepidochelys kempii* Garman, 1880, a critically endangered species which nests on just a few beaches in the Gulf of Mexico (IUCN, 2014). This is the first known example of *L. kempii* recorded from the Cumbrian coast.

Adult *L. kempii* distribution is primarily restricted to the Gulf of Mexico, but juveniles travel out of the Gulf and an estimated 30% inhabit the USA’s Eastern seaboard (Spotila, 2004). Of these turtles, foragers of northern bays must migrate south before temperatures fall below approximately 10°C to survive the winter and avoid becoming ‘cold-stunned’, a phenomenon causing lethargy, and resulting in an inability to swim against the ocean currents (Spotila, 2004). Many affected turtles wash up annually at stranding hotspot Cape Cod (a peninsula in

Massachusetts, North-eastern USA), where a record high 1200 turtles (mostly juvenile *L. kempii*) were reported in winter 2014 (Gorman 2014). A rapid seasonal ocean temperature drop and increased hatchings following conservation efforts is suggested to be the main cause of the surge in strandings (Gorman, 2014; JHU Press, 2014). Some cold-stunned turtles reach Europe, thought to be carried by the Gulf Stream (Penrose pers. comm., 2015). In the UK and Ireland a 10-year record strandings high, four from 2011, was matched in 2014 according to the TURTLE database (Penrose & Gander 2014; Penrose pers. comm. 2015). All four were juveniles found within seven days in December: 19th – Formby, Lancashire; 20th – Walney Island, Cumbria; 24th – Tarbert, Scotland; 25th – Donegal, Ireland.

Linked to the same event, these were followed by single strandings in Jersey and the Isle of Tiree, Scotland in January 2015. Up to March 2015, there are now 48 (including 15 in the past decade) UK and Ireland *L. kempii* records (dead or alive specimens) on the TURTLE database, mainly from Wales and Southwest England. The Walney Island stranded turtle out-lived all other 2014/15 UK live strandings but never fed in captivity and eventually perished on 23rd January 2015. A post mortem revealed that the turtle had been suffering from multiple abscesses throughout the lungs and there was also evidence of infection within the coelom. The 1.71 kg, 32 cm carcass, thought to be of a young female, is now being held by the Zoological Society of London for further tests and research (Temple pers. comm., 2015; Penrose pers. comm., 2015).

### *Sources and acknowledgements*

Databases searched in the course of preparing this note were: Cumbria Biodiversity Data Centre, Tullie House Museum; National Biodiversity Network (NBN) Gateway; Marine Environmental Monitoring TURTLE Database. My thanks are due to Paul Sloan (Lake District Coast Aquarium) and John Watson for providing key facts and further contacts, and to Vicki Temple for post mortem information and photograph usage. I am also very grateful to Rod Penrose for accessing the TURTLE database on my behalf and providing recent UK and Ireland stranding information.

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### **The 1875 record of a Eurasian Scops Owl at Renwick, Cumberland revisited**

On 15 May 1875 J.R. Dryden shot an unusual owl at Renwick, between Penrith and Alston, in what was then Cumberland. It proved to be a Eurasian Scops Owl (*Otus scops*), and a notice about its capture duly appeared a few days later in the *Field* (Dryden, 1875). Shortly afterwards, presumably alerted by the publication of this note, it was purchased from Dryden by J. Whitaker, a well-known collector and ornithologist from Rainworth, Nottinghamshire. Macpherson (1892) relates in the *Vertebrate Fauna of Lakeland* that he visited Rainworth two years later and examined the skin and was evidently satisfied with the identification. In 1889 he visited Renwick and spoke to members of the Dryden family (J.R. Dryden having meanwhile died) and was able to confirm the particulars of the bird's provenance.

On Whitaker's death his collection passed to Mansfield Museum in Nottinghamshire and this is where the specimen is currently kept. In March 2014 I had an opportunity to visit the Museum, primarily to check the identification and determine the bird's age when it was taken. It is a mounted specimen and still in good condition: Mansfield Mus. Cat. no. 1982-3; List No. 502 (Whitaker Collection no. 121).

I noted following details of the specimen:

*General description:* A small owl, roughly the size of a Little Owl (*Athene noctua*), with cryptically marked light greyish plumage and distinctive ear-tufts (and see accompanying photograph).

*Body plumage:* Upper parts mainly light silvery grey, each feather having a characteristic narrow black shaft streak and rather indistinct vermiculations; ground colour creamish or in places light rufous; underparts light greyish white with narrow black streaks but more widely spaced than on back.

*Wing:* Outer primaries with series of dark bars becoming less distinct and slightly narrower towards the tip; these dark bars interspersed with cream-coloured bands becoming greyer and less distinct towards the tip; some contrast evident between the inner and outer greater coverts.

*Feather wear:* Wear on main flight feathers (primaries, secondaries and tertials)

and tail feathers uniform and generally slight.

*Biometrics*: wing length 156 mm; tail length 67 mm; bill length to cere 9.6 mm; bill length to forehead 15.3 mm.

The size, plumage and distinctive ear tufts of this bird clearly identify it as a Eurasian Scops Owl and confirm the earlier assignments of Dryden, Whitaker and Macpherson. Sexing the species is difficult, for males and females are alike as to plumage, but do differ slightly in size, with females averaging a little larger than males (Cramp, 1985). Wing and tail length measurements of this specimen fall in the overlap region between the sexes. The bill measurements, however, suggest that it was a male rather than a female (Cramp *op. cit.* gives bill-length to cere as follows: adult ♂ 10.0–11.4 mm, n = 10; adult ♀ 11.0–12.7 mm, n = 9, and bill-length to feathers as: adult ♂ 17.8–19.5 mm, n = 11; adult ♀ 17.1–18.9 mm, n = 10) but given the small sample sizes and lack of data for young birds this cannot be regarded as conclusive. The pattern of markings on the outer primaries, the uniform wear on the main flight feathers and the contrast in the pattern of the greater coverts indicate that this was a bird just completing its first year of life.

Eurasian Scops Owls breed across the Palearctic Region from France and Iberia eastwards almost to Mongolia. European birds winter in Africa south of the Sahara (Cramp, 1985). They occur very occasionally in Britain. All recent records have been in England south of a line between the Mersey and the Humber, but older records including those from the 19th century are more widely distributed in Britain and Ireland (Dymond *et al.*, 1908). The Renwick bird was probably an inexperienced migrant returning for the first time from Africa to Europe, and which had overshot its intended destination.

This was the first record of a Eurasian Scops Owl in what is now Cumbria. There has been one other generally accepted record, a bird shot at Broomrigg, near Armathwaite, on 6 November 1907 (Parkin, 1908), and two other possible sightings that were not adequately documented at the time and are not now considered acceptable (Hutcheson, 1985; Cumbria Naturalists Union, 2007).

### *Acknowledgments*

I am indebted to Mansfield Museum for granting access to the Renwick bird and to Jodie Henshaw and Liz Weston of Mansfield Museum for their help in arranging my visit.

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*The 1875 specimen of  
Scops Owl from Renwick,  
now in store at  
Mansfield Museum*

© Robin Sellers



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### **The plant bug *Corizus hyoscyami* (L.) (Hemiptera: Rhopalidae) reappears in Cumbria**

On 9 September 2014, John Parker and I were surveying for insects on a shingle-bank in the River Caldew at Sebergham (NY356415). JP swept a distinctive, 1 cm-long, scarlet and black-patterned bug in his net, which was instantly recognisable as *Corizus hyoscyami*, sometimes called the Cinnamon Bug. This warmth-loving species of southern coasts has been spreading northwards in recent years and is now reported throughout England and Wales as far north as Yorkshire and Merseyside. It feeds on various plants including Rest-harrow (*Ononis repens*), which is present on the shingle-banks of the Caldew. These insects overwinter as adults with the new generation appearing late summer. *C. hyoscyami* has only been found once before in Cumbria, in the mid-19th century, when it was reported from Ravenglass (Douglas & Scott, 1865). Only a single specimen was found at Sebergham and it may be that this was an outrider ahead of the northward advance of this species.

The shingle-banks of the River Caldew are apparently a local ‘hotspot’ for thermophilic insects not normally found so far north – F.H. Day found the only confirmed Cumbrian example of the Five-spot Ladybird (*Coccinella quinquepunctata*) here in 1922 (Day, 1923) and the Nettle Groundbug (*Heterogaster urticae*) was reported new to Cumbria on the Cummersdale shingle banks in 1998 (Hewitt, 1998).

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### **The maritime ground beetle *Aepus robinii* Laboulbene, 1849 (Coleoptera: Caribidae) discovered in Cumbria**

On 13 September 2014, a single adult *Aepus robinii* specimen was found crawling across a rocky outcrop at Oldside shore, Workington (NX993305) by Lucy Merry and myself during a Cumbria Wildlife Trust ‘ShoreSearch’ survey. The specimen was confirmed by Stephen Hewitt and John Read, and added to the collection of Tullie House Museum. This Nationally Scarce (Nb) carabid is widespread but locally distributed around British rocky shores; globally it is found from western Scotland south to the Iberian Peninsula and into the Mediterranean (Luff, 1998).

*A. robinii* is characterised by protruding rudimentary eyes and lobed elytral apices, separating it from the other entirely yellow-brown, small (< 3mm long), flat, rarer member of the genus found in Britain, *Aepus marinus* (Luff, 2007). Both species are stenopic - adapted for life in the intertidal zone of rocky shores where they are thought to hunt maritime collembolans amid tidal submergences (Lindroth, 1974). As high water approaches *Aepus* species are forced to retreat, *A. robinii* to air-filled sandy rock crevices and *A. marinus* usually to the underside of stones on sand but also to crevices (King *et al.*, 1982). Both adults and larvae of *A. robinii* have been found together in early spring suggesting the species may breed at any time of year (Luff, 1998). Luff had found *A. robinii* near an aggregation of the collembolan *A. maritima*, suggesting the latter as a probable prey species.

With likely habitat continuity and old records north and south of Cumbria at Carrick and Rhoscolyn, respectively, the cryptic ecology and small size of *A. robinii* make it likely that the beetles' presence in Cumbria has gone unnoticed by coleopterists past and present. With this in mind, it is hoped that future attention to its habitat will lead to the discovery of *A. marinus*, as well as more sites for *A. robinii*. The intertidal bug *Aepophilus bonnairei* is also an unrecorded possible resident of Cumbrian shores, having similar habitat requirements. The databases of the NBN Gateway and of the Cumbria Biodiversity Data Centre (Tullie House Museum) have been searched in support of this note.

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**The Nationally Vulnerable cranefly *Prionocera pubescens* Loew (Diptera; Tipulidae) new to Cumbria**

As part of a study gathering information on the wildlife of land purchased by Cumbria Wildlife Trust at Eycott Hill, Berrier, near Penrith, a survey of invertebrates was commissioned by CWT. A focus of the survey was to establish whether any species of conservation interest occur on the site. Insect groups of wetland situations were therefore targeted, with an emphasis on certain families of Diptera and Coleoptera alongside other insect Orders. After an initial wider survey of the site it quickly became apparent that the areas of greatest interest are the valley mires and subsequent visits have therefore concentrated on these areas. A single male of the cranefly *Prionocera pubescens* was collected on the most easterly of the mires on 1 June 2014. This Nationally Vulnerable species is associated with basin and valley mire bogs, especially areas of *Sphagnum/Juncus* grading into *Carex nigra/Menyanthes*, or *Molinia* into small *Sphagnum* pools. There are a dozen or so widely scattered sites reported for this species across Britain, at six of which the species has not been recorded since 1960 (Falk, 1991). The nearest locations at which *P. pubescens* has been previously found are the Cheshire mosses, in Yorkshire and on Kirkonell Flow in Dumfries and Galloway.

Other rare craneflies recorded at Eycott Hill include the Endangered *Idioptera linnei* – restricted to acidic *Sphagnum* bogs, and the Nationally Rare *Triogma trisulcata* – a species which develops in aquatic moss in boggy runnels and mountain streams. The former species, which is very localised on the mires at Eycott Hill, has been recently recorded from a number of high quality acid valley mires in Cumbria – Wan Fell, Cliburn Moss, Parkgate Tarn and Blackmoss Pool, though probably lost from the last site due to habitat degradation.

*Reference*

Falk, S.J. (1991) A review of the scarce and threatened flies of Great Britain (Part 1). *Research and survey in nature conservation*. No. 39. Peterborough: JNCC.

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## Survey of Dwarf Willow (*Salix herbacea* L.) distribution on the 'Wainwright Tops' in Lakeland

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Previous surveys have reported that *Salix herbacea* was recorded in Holocene times from Bodmin Moor in Cornwall, the North York Moors and the southern Pennines, but is now considered to be extinct in these localities. It survives in the Lake District generally over 640m, so altitude and the associated exposure appear to be important limiting factors. It survives in open habitats, where the exposure restricts further plant succession. Pearsall (1950) gave an early account of the ecology of *S. herbacea*. He considered block scree or mountain top detritus on flatter crests ideal for colonisation by willow. He further noted that altitude retards flowering and fruiting, until the end of July or later, and that viable seeds are not produced above 800 m. Dwarf Willow grows best where the ground is kept open by frost heave. Pearsall & Pennington (1973) noted its presence as a 'carpet' on Fairfield, Helvellyn, Sharp Edge, Grasmooor, Skiddaw and Sail, (plate 7). Beerling (1998) opines that the Dwarf Willow requires some degree of regular disturbance of the local habitat in order to thrive. Its dwarf habit with creeping, sub-surface rhizomes would appear to restrict its competitive ability compared to other dwarf shrubs of the montane community. He notes that the catkins appear with the leaves in June or July, the female being more conspicuous. He noted it as 'local' on Dow Crag and Eel Crag, with an altitudinal range from 640–945 m, in block scree growing with Alpine Lady's-mantle (*Alchemilla alpina*) and Parsley Fern (*Cryptogramma crispa*). Halliday's *A Flora of Cumbria* (1997) has 48 Dwarf Willow records, for thirteen 2×2 km tetrads, and notes that Dwarf Willow was found in 1918 within Cumbria on Cautley Crag (ca. 640 m) in the Howgill Fells, and on Great Coum (687 m) above Dentdale (plate 8).

Alsos (2009) reported research in Scandinavia on the impact of climate change on the genetic diversity and geographic ranges of *Salix herbacea*. He noted that *S. herbacea* grows in wind-exposed places, such as screes; it is a poor competitor yet requires habitats with some disturbance. It requires a snow-free period of over three months in order to flower and fruit. Seed-set in Scandinavia may amount to over 4000 seeds/m<sup>2</sup>, the plumed seeds being distributed by wind. Reproduction by seed is rare, and most stands spread vegetatively. *S. herbacea* can colonise de-glaciated terrain within 20 years, but is considered intolerant of prolonged soil drying. It is unknown to what extent these conditions apply in the Cumbrian Fells. Recent models predict a loss of most alpine populations of *Salix herbacea* from Britain by 2080, when suitable conditions may be largely restricted to Scandinavia.

Survey of the distribution of *Salix herbacea* on Cumbrian fell-tops developed out of a Cumbria Wildlife Trust (CWT) Upland Juniper project, which arose from concerns that Juniper bushes in Cumbria were dying and were not regenerating. It was felt that previous distribution records did not provide sufficient data to aid conservation and to guide replanting schemes. Further details of the *Uplands for Juniper Project* can be obtained from CWT ([www.cumbriawildlifetrust.org.uk](http://www.cumbriawildlifetrust.org.uk)).

The Dwarf Willow survey has some similarities with, and some distinct differences from the Upland Juniper Survey. Both used as the starting point distribution data as reported in *A Flora of Cumbria* (Halliday, 1997), from recordings of populations over the previous twenty years. Baseline populations had been recorded as present/absent in 2×2 km tetrads within the 10 km grid squares. Presence/absence records have little or no report of local habitat factors; thus, although altitude may have been recorded, other important factors such as aspect, angle of slope, grazing regime/intensity, adjacent competitor species, presence and size of stones, rocks, boulders, were not systematically recorded. Apart from anecdotal evidence from the recorders at the time, there was very little data available on the health or performance of the populations. Populations in the so-termed ‘carpet habit’, *i.e.* on gently sloping ground near the summits of Lakeland peaks or on connecting ridges, were known to be of variable extent, but with no exact data on the total area covered, nor any estimate of percentage cover. Significant differences include the following: Dwarf Willow, in contrast to the Juniper, is deciduous, and the appearance of new leaves in spring and leaf fall in autumn are important indicators under the general heading of ‘plant phenology’. Numbers of individual plants are relatively straightforward to count for Juniper, whereas in large areas of willow in carpet habit it proved impossible to count individuals. A measure of growth for Juniper bushes can be estimated from height, lateral spread, trunk girth, etc., whereas the woody stems of Dwarf Willow are not always visible above ground, and if so, may be only in the range of 2–4mm diameter. Leaf size for Juniper is incidental, whereas for the willow, this can be measured as a proxy for health and vigour of the individual plant. Without a more sophisticated measure of performance for Dwarf Willow, it has proved impossible to categorize populations according to the system used for Juniper stands, *i.e.* as expanding, stable, or declining. There seems to be no evidence in the literature for active intervention to increase populations of Dwarf Willow in its upland habitats, either by planting seedlings or by seed distribution, whereas planting of Juniper seedlings has been demonstrated as a successful tool in encouraging upland restoration.

*‘Willow on Wainwrights’: methodology\**

Since 2012, fell-walking volunteers have carried out a regular pattern of searches to survey for Dwarf Willow on ‘Wainwright’ fell-tops. This project has proved

very popular with the volunteers, whose assiduous surveys have greatly expanded the existing database. Standard botanical recording of the presence of Dwarf Willow, even by tetrad, does not provide sufficient detail to be able to identify individual stands which can be re-visited easily, in order to judge their health and status through time. In the current survey, using a hand-held GPS meter, volunteers recorded a 10-figure grid reference, altitude range, and an estimate of area covered. In addition, presence of male or female flowers/ catkins, and of sawfly galls (*Eupontania herbacea*) are recorded, together with notes on habitat, including aspect and slope.

### *Summary of 2012–13 surveys*

Findings indicate that the Dwarf Willow is now largely limited to fell tops over 700 m (only 17% or approximately 12/70 of Cumbrian localities are significantly below this). Surveyors report Dwarf Willow from two types of micro-habitat: ‘carpet’, where it is growing in open stony ground (stone size appears to be a crucial factor), sometimes apparently competing with vigorous Mat-grass (*Nardus stricta*) and Fescue (*Festuca* spp.) grasses, *Racomitrium* moss, and other plants such as the *Vaccinium* species Bilberry and Cowberry, and Heath Rush (*Juncus squarrosus*). In other areas, the willow is found in a ‘crevice’ habitat, in both vertical and horizontal cracks in large boulders, its tiny trunk creeping along the narrow cracks. It has been found on Borrowdale Volcanic rocks, on the Skiddaw Group in the northern Lakes, and on the Millstone Grit in Dentdale.

Ninety-seven Lakeland ‘Wainwright’ summits were surveyed; 54 were found to have Dwarf Willow, it was not found on 43. Around 50 summits remained to be surveyed. Dwarf Willow was found down to an altitude of 535 m on Buckbarrow, an outlying fell to the southwest, and at 975 m on the summit of Scafell Pike, in trampled and grazed turf. Willow was also found on Black Combe, a new record and the furthest south in the county. The survey database recorded 296 locations, including 20 records for the Crinkle Crags ridge and many more sites in the ‘Eastern’ and ‘Far Eastern’ fells than were previously known. Use of GPS has given precise locations and altitude, and in some cases extent and a measure of abundance was calculated. Of the two microhabitats identified, the so-called ‘carpet’ habit described 230 locations on 38 summits. Favoured sites seem to be north facing, slightly convex, water-shedding sites, slightly sloping, about 50% bare ground, with only small stones. Dwarf Willow is sometimes associated with the moss *Racomitrium*. The ‘crevice’ habit was found for 66 records on 25 summits; 9 summits were found to have both habitats: 11 summits had willow only in crevices. One seed head and evidence of grazing (a nibbled leaf) were seen on Thornthwaite Crag. There are only three records of galls in crevices, on Slight Side (at 720 m on 27 July 2013), Robinson (737 m on 13 Aug 2013) and Raise, Helvellyn (880 m on 10 Aug 2013). Individuals growing in rock crevices appear

to show fewer male and/or female catkins and galls than elsewhere. There were 58/229 gall records on plants in carpet habit, and only 3 records of galls on leaves in crevices. Galls were generally absent from Dwarf Willow occurring in crevices. The presence of galls showed a predominantly western pattern, occurring predominantly over 700m.

In addition, base-line data for the phenology of flowering was collected. This will provide interesting comparisons on the possible effects of climate change over time. Contrary to early expectations, both male and female plants and galls were noted together on Brandreth (690-715m) as early as 23 May 2012. Male plants were noted on 14 summits and female plants were identified on 24 summits. Large extents of willow occur on Red Pike (Buttermere), Dove Crag, St Sunday Crag, Crag Hill, Grasmoor, and Raise. Western peaks appear to have larger extents of Dwarf Willow, extending to lower altitudes, the explanation for which is presently unknown. Outside the Lakeland Fells, Dwarf Willow was not re-found on Cautley Crag in the Howgills, as recorded in the Flora of Cumbria (Halliday, 1997).

### *The 2014 Survey Season*

2014 proved a good season, with Dwarf Willow found on an additional sixteen new 'Wainwright' tops, with different areas and greater extent of known stands being found on seven 'Wainwrights', where its presence had already been recorded. Fresh leaves and flowers were in evidence from mid-May, although maximum leaf size was still only  $25 \times 35$  mm.

The Dwarf Willow has now been recorded on 70 'Wainwrights', from Bakestall and Bowscale Fell in the north to Black Combe, its southernmost locality in Cumbria, where additional stands were recorded this year. The furthest outlier to the east was confirmation of a very healthy population on Great Coum in Upper Dentdale. In Lakeland, populations were found on Grey Crag and Tarn Crag above Longsleddale. In the West, stands were recorded from Caw Fell and Starling Dodd on the ridges of Ennerdale. The earliest finds in an 'early spring' were on 14 May (Yoke at 664 m altitude), and on High Raise (Low White Stones at 732 m) the following week. These records were both in carpet habit. At the end of the season, plants were found on Black Combe at 580 m (11 November), and on Dow Crag at 750 m (29 November). Both these records were from the crevice habit, the plants now reduced to woody, creeping stems, with decaying leaves adjacent. The Dwarf Willow is an opportunist arctic-alpine species, highly adapted to a short growing season, and clearly able to exploit the improved climate on an annual basis. A sample of the 2014 data is shown in Table 1 (opposite). The use of GPS technology has enabled surveyors to record a new 'find' in one year and to return to the exact location the following season, which permits an assessment of the extent and health of the population.

The outstanding questions which remain are focused on finding a reliable proxy

Table 1: Findings from the Dwarf Willow Survey in 2014: sample records from Wainwright summits

Date	Grid reference	Wainwright summit	Sex	Altitude range (m)	Area (m <sup>2</sup> )	Sawfly galls	Comments
14-05-14	NY4354606219	Yoke, Kentmere	M	664–666	< 0.1	absent	E-W vertical crevices on SW outlier of Yoke; NW aspect of rocky knoll; new, young leaves, maximum leaf size 14 mm x 12 mm; woody stems 2 mm diameter
21-05-14	NY2827010023	High Raise, Langdale	M	732–734	2	absent	Frequent individuals in E-W vertical crevices, spreading into adjacent grassland carpet habit; stem height 2–3 cm; maximum leaf size 13 mm x 15 mm; numerous sawflies
31-05-14	NY1530011260	Scoat Fell, Ennerdale	M & F	780–785	7	absent	Stony grassland turf below a rock cliff
11-06-14	NY3704413835	St Sunday Crag, NE ridge	M & F	774–841	500	present	Crevice and Carpet habit in short, stony turf with dwarf shrubs, grass and herbs; plant height up to 8 cm; maximum leaf size 14 mm x 14 mm; some woody stems visible
20-06-14	NY2380007400	Esk Pike	F	850	< 0.1	present	Vertical rock crevices with club-mosses
24-06-14	NY2880001090	Wetherlam	not recorded	750–762	0.02	absent	Parallel, NW-facing rock crevices 2 cm x 50 cm @ 1.5 m above ground; maximum leaf size 16 mm x 16 mm; woody stems 4 mm diameter; evidence of grazing
14-07-14	SD6956683678	Great Cumb, Dentdale	M & F	661–666	3	absent	Luxuriant growth in horizontal cracks in Millstone grit, 12 m above ground, N–NE aspect; shoot length up to 15 cm; woody stems 4 mm diameter; leaves 20 mm x 24 mm; evidence of sheep grazing lower leaves
26-08-14	NY3422018957	Stybarrow Dodd	F	834–836	20	present	Carpet habit in short, stony turf, c. 7 degree slope; maximum leaf size 12 mm x 10 mm; woody stem 1 mm diameter; associated fungal fruiting body
29-11-14	SD2625197944	Dow Crag	not recorded	750	< 0.1	absent	Vertical crevices in volcanic rocks N of summit; dead leaves still evident; maximum leaf size 10 mm x 7 mm; obvious woody stems with buds, 2 mm diameter
21-05-14	NY2825007450	Harrison Stickle	n/a	710–736	absent	n/a	Suitable rock crevices and turf areas apparent, but very heavy trampling across the whole summit area
09-07-14	NY3950008500	Red Screes, Kirkstone	n/a	715–776	absent	n/a	Sleep, eroded ground in the gully south of summit; repeated searches have failed to find previously recorded population

measurement for health/performance, and an accurate method for detailed mapping of the population extent, particularly in the carpet habit within a turf of competing species. Not all the 'Wainwright' tops have been subject to a detailed survey, and previous records show that there are still a number of re-finds which have proved elusive to date.

### *Discussion*

Attempts have been made to assess the health of Dwarf Willow populations by proxy measures, such as maximum leaf size, maximum trunk diameter and area covered. It has been suggested that Dwarf Willow may well prove to be an indicator species for montane vegetation, and its predicted disappearance from the fells may be a preliminary indication of some effects in Cumbria of climate change. For this reason the survey is continuing into 2015, with a focus on completing the baseline data, with repeated photography of selected Dwarf Willow stands, and collecting more details of its local habitat factors and competitors.

Interest has been shown in identifying associated species in order to gain a fuller picture of the plant community. A number of fungal fruiting bodies have been recorded: these are found more frequently with other Willow species, but may have ectomycorrhizal associations with Dwarf Willow. Beerling (1998) makes reference to a wide range of fungal associations with *S. herbacea*, including *Boletus* spp., *Lactarius* spp., and *Russula* spp. A rust fungus, parasitic on the Dwarf Willow, was recorded from Stybarrow Dodd in 2014.

Dwarf Willow is also host to a specific sawfly, *Eupontania herbacea* (plate 7, inset). Little is known about the details of this association, apart from the visible insect galls through the season. It is interesting to speculate concerning a role for the sawfly in pollination, when wind pollination is the usually accepted method for willow species.

The observed distribution of *Salix herbacea* still generates many as yet unanswered questions, not least why it occurs on some summits and not on others, where the altitude and micro-habitats would appear suitable. For example, Dwarf Willow was recorded in 1992, and also previously, on Red Screes but has not been re-found despite repeated searching.

A final, 'neutral' comment is that, as with Juniper, populations of Dwarf Willow in the Cumbrian uplands may show natural fluctuations over timescales which we are unable to measure effectively. However, without a present-day baseline dataset, we are unable to state whether or not Dwarf Willow is in decline as a species, nor to what extent such decline might be associated with climate change. One of the current survey volunteers has described the Willow as 'our canary in the uplands'. Whether or not we are able to utilise the occurrence and performance of this remarkable arctic-alpine relict from the ice-age remains to be seen.

*Purposes underlying the Project and where next?*

Choice of this particular species for a distribution survey was based on literature reports. The limited distribution of a previously more widespread arctic-alpine flora, is said to have been caused due to changing land management in the uplands, with possibly an underlying influence of environmental climate change. The species has disappeared from SW England, the Peak District, and possibly from much of North Wales during the 20th Century. Existing records for Cumbria were based on the 1997 edition of the *Flora* (Halliday, 1997), and montane scrub communities are reported to be in steady decline since then.

Why should the decline of a single species matter? Reasons include: a) reduction in biodiversity in montane communities within the uplands; b) the growth form and habit of *S. herbacea* is distinct and may serve as an indicator species for wider, montane scrub communities; c) it suggests that human management of the uplands is not as good as it could or should be.

The observed, discontinuous distribution of Dwarf Willow stimulates questions requiring the need to identify and measure a series of environmental factors which might limit distribution and growth: these factors characterise the high fells of Lakeland. A particular challenge was presented in developing appropriate methodologies for study of the distribution and performance of this dwarf, arctic-alpine plant, primarily found above 650 m. Study of the regulatory environmental factors and their impacts will require further innovation.

Comparison of Dwarf Willow autecology with other montane scrub species, such as Juniper, suggests that potential restoration of vegetation by raising plants in nurseries and planting out may prove impossible: at present, there appears to be no information on this possibility.

Reference to Dwarf Willow records from Scotland suggested the idea of developing a comparative study with its occurrence and distribution in Cumbria: these are very early days, as yet. Dwarf Willow is widely distributed and shows vigorous growth in the Highlands of Scotland, but information on its distribution in the Borders and Southern Uplands would be valuable for comparison with Cumbrian data. This raises the potential for sharing data and ideas with Scottish Natural Heritage Montane Scrub Action Group (MSAG).

Finally, the intention is to continue the Survey for a further season through 2015, to 'fill in the gaps in the Atlas'. Any volunteers to help the current Survey Team would be most welcome. Further information on all aspects of volunteering may be obtained from Jamie Normington, Senior Education, Volunteering and Training Officer at the Cumbria Wildlife Trust.

### *Acknowledgements*

Our thanks are due to Mike Douglas, who came up with the original idea and provided us all with initial training, and to the other members of the volunteer survey team: the results obtained so far represent an aggregate of assiduous work by a number of people. Thanks also to the Director of Cumbria Wildlife Trust, Peter Bullard, and his staff for their continuing support and encouragement.

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[\* The expression 'Wainwright' in relation to the Cumbrian fells derives from those mentioned in the well-known series of walking guidebooks published by A. Wainwright (1955–66). In practice these usually amount to hilltops exceeding 1000ft (305 metres) in altitude. *Ed.*]

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## Northern Deergrass (*Trichophorum cespitosum* (L.) Hartm.) on the Solway raised mires

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The Northern Deergrass (*Trichophorum cespitosum sensu stricto*) has been known in Cumbria only since 2010, when it was found in local abundance on the raised mires at Butterburn Flow (Roberts, 2011). (Note at the outset that the name *Trichophorum cespitosum* is currently restricted to this rarer species. The familiar deergrass known for many years by this name, or as *Scirpus cespitosus*, is now referred to as *Trichophorum germanicum* Palla.)

The overwhelming abundance of the sterile hybrid between these two species, *T.* × *foersteri* (Swan) D.A. Simpson, in many of the habitats occupied by *T. cespitosum* continues to compromise our knowledge of the distribution of *T. cespitosum* itself, and work is continuing to determine the exact extent of the latter in the British Isles. To date its British range appears to be broadly northern and upland, and this fits with its Circumpolar Boreal-montane world range (Preston *et al.*, 2007).

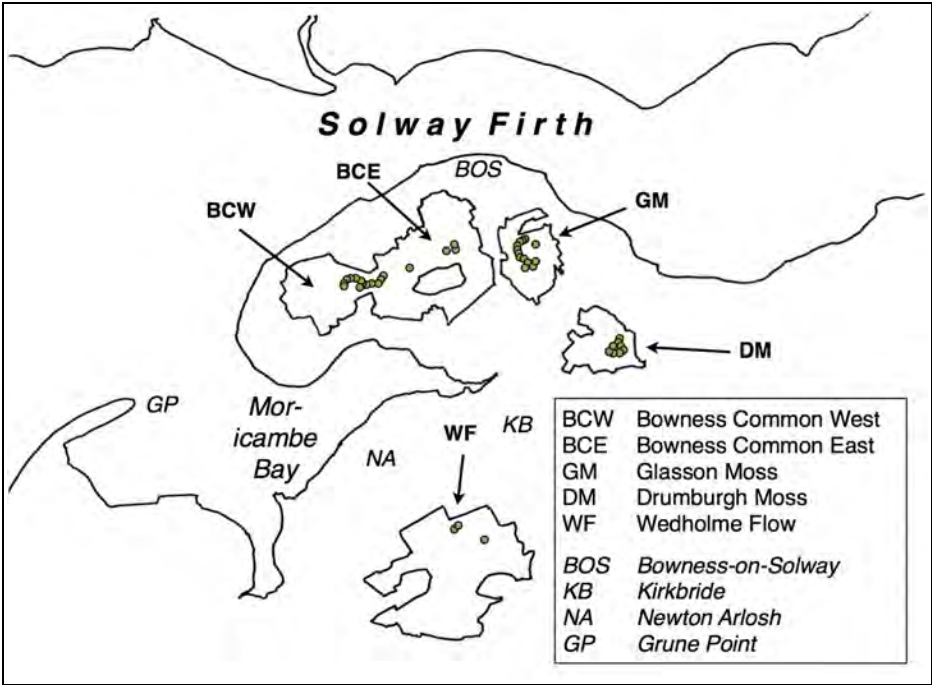
At Butterburn Flow, and others of the Border Mires, *Trichophorum cespitosum* grows on raised acid mires at around 280 m a.s.l. with associates such as Hare's-tail and Common Cottongrasses (*Eriophorum vaginatum* and *E. angustifolium*), Heather (*Calluna vulgaris*), Bog Asphodel (*Narthecium ossifragum*), Cross-leaved Heath (*Erica tetralix*), Round-leaved Sundew (*Drosera rotundifolia*), Bog Rosemary (*Andromeda polifolia*), and Cranberry (*Vaccinium oxycoccos*). This type of community accords well with the National Vegetation Classification 'M18 *Erica tetralix* and *Sphagnum papillosum* raised and blanket mire' (Rodwell *et al.*, 1991).

Given that similar M18 communities also occur almost at sea-level on the raised mires of the South Solway Mosses NNR, it was an open question as to whether *T. cespitosum* would also be present at these lower levels. In the late season (2 September) of 2012, I walked along the boardwalk at Glasson Moss, and amongst scattered populations of sterile hybrid deergrass I soon located a few tufts of deergrass carrying ripe fruits – and hence not the hybrid – with the narrow, wiry stems and abbreviated upper leaf-sheath openings suggestive of *Trichophorum cespitosum*. (*T. germanicum* has wider stems (up to 1 mm), and the leaf-sheath-openings are strongly oblique.) Later examination of stem cross-sections under the microscope confirmed that these plants were indeed *T. cespitosum*. Populations of the hybrid seemed to be considerably more abundant, whilst a few plants of *T. germanicum* were also found on more disturbed parts of the mire close to the boardwalk.

In the late summer of 2013 I set out to determine how widespread or otherwise

*T. cespitosum* was on the South Solway Mosses (plate 4). Over six days I found that this plant was indeed present on all five areas of raised mire (Bowness Common, both West (NY2060) and East (NY2260); Glasson Moss (NY2360); Drumburgh Moss (NY2658); Wedholme Flow (NY2254)). Nowhere was it abundant, and (as at Butterburn Flow) there was far more of the hybrid plant, perhaps in the order of ten times the frequency. Circles on the map below show where the plant was recorded along the tracks taken. (NB: many overlapping circles removed for clarity.)

**Figure 1:** Distribution of *Trichophorum cespitosum* s.s. on five South Solway Mosses



### *Estimates of population size*

At each of the five sites, somewhat erratic transects were undertaken from access points on the margins across to the apparently more ‘promising’, less-damaged, interiors, and any plants of *Trichophorum cespitosum* pinpointed using GPS. This enabled an impression to be gained of the distribution of the plants across some parts of the sites, and also a very rough estimate of the population sizes – see Table 1 opposite. (Total populations were assessed by assuming that all plants had been located within one metre on each side of the actual track taken, giving a

‘search track’ width of approximately two metres, from which – using the length of the search track given by the GPS meter – an approximation of the area of habitat actually searched could be estimated. The calculated area searched could be compared with the total area of the suitable habitat (using ‘Where’s-the-path’, URL below) to give population size, albeit within very wide limits.)

**Table 1:** *Trichophorum cespitosum* s.s. plants counted, and estimated populations, at five sites

Site and date(s) visited	number of plants found	search track length (km)	approx. search track area (m <sup>2</sup> )	approx. area of suitable habitat (ha)	estimated population
Glasson Moss (3/8)	71	3.2	6400	39	4000
Drumburgh Moss (6/8)	38	2.21	4400	67	6000
Wedholme Flow (14/8; 2/9)	7	4.9	9900	61	450
Bowness Common W (26/8)	62	1.81	3500	176	30000
Bowness Common E (28/8)	8	2.23	4400	105	2000

In general terms, the vegetation and the general physiological features of the Solway Mosses in the areas occupied by the plant were similar to those at Butterburn Flow, in spite of the considerable difference in altitude – 10–14 m vs. 275–285 m a.s.l. respectively. The close associates of the plant were similar to those already mentioned, but with the frequent presence of White Beak-sedge (*Rhynchospora alba*), which is very localised at Butterburn Flow.

There seemed to be an effective inverse correlation between the frequency of the plant and the degree of disturbance to the site. It seems possible that *Trichophorum cespitosum* requires at its roots a consistent water supply (more typical of the ‘core’ areas of these mires), whilst the hybrid may be less demanding in this respect, as is its *T. germanicum* parent, the latter persisting on drier heaths. Where there is evidence of damage to the peat surface due to burning, drainage or peat-digging, then those are the places where *T. germanicum* tends to occur. Conversely, it is a striking feature that *T. germanicum* is effectively absent from the least disturbed areas of the mires – as also at Butterburn Flow. Wedholme Flow in particular has suffered from this kind of disturbance over large areas, and it is here that *Trichophorum cespitosum* seems most localised and only tiny populations have been uncovered so far.

Some edaphic characters were obtained (pH and electrical conductivity with a Hanna meter and dissolved oxygen with a WalkLAB meter) at some sites, as in the table below. The pH levels (below pH 4, i.e. strongly acidic) show consistency, although it would be an interesting exercise to see if the pH altered measurably over the year. Electrical conductivity (EC) varies more; a measure of actual total

dissolved solids (TDS) has been derived from the EC data using a (widely accepted) factor of 0.64 (EC to TDS, microsiemens ( $\mu\text{S}$ ) to parts per million). Levels of dissolved oxygen are more difficult to measure. Oxygen dissolved in surface waters are typically more-or-less in equilibrium with the air, and consistently around 10 parts per million (at an ambient temperature of  $15^{\circ}\text{C}$ ). Excavating small sample-holes down to the roots of deergrass tussocks at a depth in the peat of 15–20 cm allowed water from the peat to seep in, giving the readings in the table. The readings must reflect to an unknown degree the tendency of surface waters of higher oxygen content to drain into the hole and mix with deeper waters.

The data are comparable with similar figures collected at Butterburn Flow in April 2012, the pH indicating slightly more acidic conditions here (those at Butterburn Flow being consistently more than 4.0), whilst levels of dissolved solids and dissolved oxygen are similar. It is remarkable that the very deep-rooted deergrass can grow its roots down into such oxygen-deficient levels in the peat (down to only 1.7 parts per million), and it seems probable that the plant is able to transfer oxygen down through its stems to provide the roots with the oxygen required for respiration. The stems of Common Deergrass have air-channels within the green tissue (chlorenchyma) running the full length of the stems, which may increase gaseous transfer. Northern Deergrass completely lacks these channels, although both species have a central channel. (See Roberts (2009) for an explanation of the internal structures of the two deergrasses and their hybrid.)

**Table 2:** *edaphic data for three sites*

	pH	total dissolved solids (ppm)	dissolved oxygen (ppm)
Glasson Moss	3.76; 3.82; 3.92; 3.80	31; 41; 38; 40	2.7; 3.9; 3.6; 4.5
Bowness Common W	3.79; 3.87; 3.86; 3.80	67; 52; 63; 62	2.6; 1.7; 3.3; 2.8
Bowness Common E	3.78	72	1.7

*Addendum: Trichophorum cespitosum in the Lake District*

Despite much searching, *Trichophorum cespitosum* s.s. has been found to date at only two sites in the Lake District hills. Surely other sites await discovery.

At the head of Launcy Gill, west of Thirlmere, it grows in a number of springs and adjacent *Sphagnum* lawns (NY293156, etc.; 445–460 m a.s.l.). Some of the springs show a certain amount of mineral enrichment, with plants such as Butterwort (*Pinguicula vulgaris*). Rather surprisingly, the species was not found in the extensive mires on Armboth Fell just to the north, where the habitat looks very

suitable, and several of the often-associated species occur.

The other site is in a beautiful area of flushed mires at the south end of High Rigg, east of the A591 at Rough How Bridge (NY302206, etc.; 170 m). Here there are many plants – some of them forming tussocks of considerable size – at the edges of, and even emergent from, the drainage rivulets and associated shallow and vegetated pools. In addition to the associates already noted, there are also patches of Bog Myrtle (*Myrica gale*), and various willows.

The known distribution of Northern Deergrass in the Lake District can probably be extended considerably, with the most likely habitats being raised and valley mires, and, at higher altitude, extensive seepage areas. We also know little as yet about the distribution in the Lake District of the Common Deergrass in relation to their hybrid, except that both are likely to be frequent. I shall be delighted to confirm the identification of any specimens of deergrasses that readers can collect for me. Please collect a good number of stems, but note that the base of the stem with its sheath provides a useful character. (The stem bases are extremely tough, and tend to break above the sheath when plucked: such specimens are less useful.) If plants are fruiting, please ensure dropped fruits are retained in the bag. Fresh or dried specimens are both acceptable for naming. Specimens do not need to be carefully pressed and can be simply folded into an envelope to dry.

### *Acknowledgement*

I am grateful to Dr Geoffrey Halliday for many useful comments on a draft of this note.

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## **The status of the Oxbow Diving Beetle *Hydroporus rufifrons* (Müller) in and around the Lake District**

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*Hydroporus rufifrons* (Müller) is one of the rarest of the 120 species of diving beetle (Dytiscidae) known from Britain, and has shown a very high rate of decline (Foster *et al.*, 2008). Its remaining centres now appear to be in the south of the Lake District and Ceredigion, with a single known extant population in Kirkcudbrightshire. *H. rufifrons* is classified as Endangered in the UK Red List (Foster, 2010a). This paper discusses the ecology of the species in Cumbria and lists all known county records, including some previously unpublished sites from the south-east of the region.

Diving beetles have a life-cycle starting with an egg, either stuck onto or inserted into plant tissue under water. There are three larval stages, each rarely lasting long, though the third instar of some species may overwinter in the water, leaving it to construct a mud cell in which to pupate in the spring. Adult beetles can be found over most of the year with the immature phase typically completed in a month in the spring or summer. Numbers of records for adult *H. rufifrons* peak in April and September, the adults overwintering, laying eggs and dying out in the summer, with the new generation of adults emerging from pupae in the autumn – or at least that is the most plausible interpretation of the field observations. It seems likely, however, that this species is an opportunist, with a flexible life cycle taking advantage of a rise in water level to breed rather than relying solely on the season.

The adult of *Hydroporus rufifrons* is keyed by Balfour-Browne (1940) and Foster & Friday (2011). The third instar larva is keyed alongside 26 other British species by Nilsson (1989). Shaverdo (2000) redescribed the larva, which is quite dark compared to most *Hydroporus* larvae. The highly distinctive male genitalia of adult *rufifrons* at once separate this from all other *Hydroporus* species. At 5.3 mm long, and therefore one of the larger species of the recently redefined genus *Hydroporus* in Britain, *H. rufifrons* has, however, been confused with a number of species. Most populations of *rufifrons* have a mixture of individuals with and

without a pale ‘shoulder’ band, *i.e.* a pale bar across the front of the wing-cases (plate 5). Even *Deronectes latus* (Stephens) has been confused with it in the field, as confessed by the great exponent of water beetles, Professor Frank Balfour-Browne (1940); certainly the *Deronectes* may have similar shoulder markings, but it is flatter and has a very different body outline. In the experience of GNF, *Hydroporus planus* (L.) and paler representatives of a matt form of *H. memnonius* Nicolai are often submitted for checking as potential *rufifrons* – and, yes, GNF and SR once had collective hysteria, misidentifying a large *Hydroporus erythrocephalus* (L.) as *rufifrons*! A particular problem is the widespread occurrence in Britain of populations of *erythrocephalus* in which the female is dull because of the intensity of the fine sculpture of its surface, and the males, being shinier and slightly larger, can be taken for a separate species. In fact conservation effort concerning this species has been somewhat hampered by including it in the UK Biodiversity Action Plan, simply because almost all of the observations of non-expert enthusiasts have been based on misidentifications of *erythrocephalus*.

Some of the localities listed below have been published in the past but they bear repeating as part of a list of all those known in Cumbria, here in chronological order:

- Orton (NY3354) – F.H. Day, 30 April 1899 ‘two specimens in a pond at Orton on the peat’ (Day, 1933) – two specimens now in the Tullie House Museum. Also H. Britten 1 April 1901 (one specimen in Manchester University Museum).
- Kingmoor, Carlisle (NY3858) – F.H. Day, 25 May 1917, one specimen (Day, 1933).
- Wise Een Tarn (SD3797) – T.T. Macan, 31 August 1938, material in his collection owned by the Freshwater Biological Association; pool 300 m south of Wise Een Tarn – D.G. Holland 27 August 1980.
- Three Dubs Tarn (SD3797) – T.T. Macan, 16 April 1951 – 1 female seen by Professor Balfour-Browne.
- Meathop (SD438808) – R.B. Angus, 6 April 1963 (Angus, 1964).
- Thurstonfield Lough (NY320564) – R.B. Angus, 1966.
- Witherslack (SD48) – R.B. Angus, 5 September 1966.
- Pool near Boretsee Tarn (SD354877) – R.B. Angus, 1960-1964 (Angus, 1964).
- Windermere, south end of the lake (SD38) – R.B. Angus, 1960-1964 (Angus, 1964).
- Subberthwaite Moor (SD255877) – GNF, 8 April 1971.
- Staveley Park (SD4798) – P. Nicolet, May 2000 and several subsequent occasions by DTB, GNF and SR. This site’s first record was the basis of the entry in Nicolet *et al.* (2004).

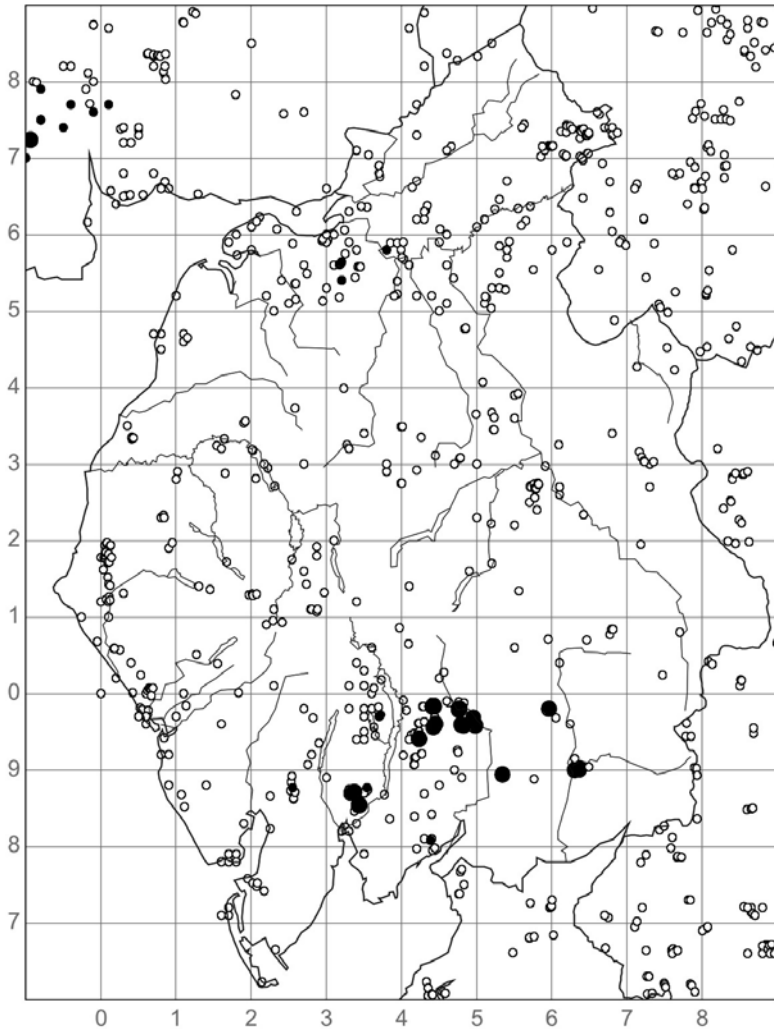
- Rusland fen and Rusland Pool (SD3485) – DTB, 24 August 2000 and four subsequent visits by DTB and GNF.
- Ings field ponds (SD4498) – GNF, 8 March 2005 and many subsequent visits.
- Rather Heath ponds (SD482958 and SD479959) – GNF and DTB, 23 March 2006.
- Pools above Boxtree (SD445960 and SD442956) – GNF and SR, 25 March 2006 (plate 6a).
- Cat Crag, part of the Winster Wetlands SSSI (SD423941) – GNF, 13 May 2006 and subsequent visits.
- Black Beck Tarn, Hay Bridge Nature Reserve (SD333870) – GNF, 10 June 2007.
- Bowston (SD495968) – SR, October 2007.
- Burneside field pond (SD498958) – GNF and SR, 26 April 2008.
- High Hay Bridge garden pond (SD337871) – GNF and SR, 26 April 2008.
- The Helm (SD534894) – SR, 5 October 2009.
- Grayrigg Tarn (SD596980) – GNF and SR, 3 November 2011 (plate 6b).
- Marsh and pond near Jordan Lane (SD6390) – GNF, 24 March 2012 and subsequent visits.

A few of these sites have produced this species in large numbers. The Windermere site originally did so, although the beetle could not be found there in the 2005-6 surveys; Staveley Park, Ings and Jordan Lane have also proved productive. However, the beetle has mostly been found in ones and twos (see below). The habitat availability in some sites, as at Rather Heath, was so limited that sampling ceased as soon as the beetle was detected in order to avoid damage.

*H. rufifrons* was found in seven out of the fifty sites (*i.e.* 14%) surveyed by Foster *et al.* (2008) in 10 km square SD49, east of Windermere. From this survey, it was estimated that there were at least 200 stagnant water sites in that square. As the beetle's distribution was known to be mainly in both SD49 and SD38 – about twice the 2008 survey area – this gave us a notional estimate of *ca.* 56 sites. A few of these have been found, but rather than continue with an exhaustive search, it was thought more desirable to see how far the distribution extended out of the southern Lake District. This resulted in discovery of the sites near to Jordan Lane and in a small pool on the edge of Grayrigg Tarn. The Jordan Lane sites lie just within the vice-county of Westmorland. A few ponds in the neighbouring part of Yorkshire have been searched without success.

In April and May 2012, LH surveyed the fourteen stagnant water sites within a kilometre of Staveley, generating 94 records of forty species of water beetle. She found *H. rufifrons* in only the two sites known already at Ings and Staveley – the same proportion occupied (14%) as in the earlier survey. If the pool density around

Staveley (4.45 per km<sup>2</sup>) is taken as an estimate of the wider situation in the 200 km<sup>2</sup> of SD38/SD49, there may be more than twice the number of pools – and potentially occupied sites – than first estimated.



**Figure 4.** The distribution of small stagnant water bodies that have been surveyed for water beetles in the region. The open circles represent sites at which *Hydroporus rufifrons* has never been recorded; the solid black circles show those in which the species has been found. The larger solid circles are records from 2000 onwards; the smaller ones show sites at which the species has not been confirmed since 1999, despite subsequent searches.

In Britain *H. rufifrons* occurs in shallow and temporary pools in unimproved pasture, often in old oxbow systems, hence the choice of common name. The water chemistry of known sites indicates avoidance of the most intensely acid sites, and also of any sites with a coastal brackish influence. Avoidance of acid sites means the species tends to be most common on mildly basic geologies, and indeed its disappearance from some sites may be linked to acid deposition. At the habitat scale the beetle appears to benefit from ‘light poaching’, *i.e.* access by livestock which keep the marginal vegetation low and create a marginal structure of foot-sized pools, but intensive trampling and grazing is likely to be highly detrimental, as this will destroy marginal habitat structure, and lead to the loss of tussocks. There is also good correlative evidence that the beetle has been eliminated from areas subject to intensification of agriculture, particularly the regular application of fertilizers or farm slurries; the timing of its disappearance from parts of its former range being associated with the spread of intensive farming practices (Foster & Bilton, 2014). In terms of hydrology, pools that dry out at some stage, or at least fluctuate significantly in level, appear to be important for this species. With many beetles this seems to be because drying-out guarantees freedom from fish, the main predators of most water beetles, but in the case of this species it is more likely that a drying-out pond with a slowly receding edge allows the prolific growth of mosses in which this beetle is often found. A specific association with rush tussocks has been noted, but the species also occurs in association with sedges, and possibly requires tussocks to pupate in summer. This species has never been found in entirely shaded ponds, and some exposed edge is required to allow the development of vegetation.

Despite general agreement about the importance of seasonal riverine pools, this species can occur on high ground in isolated water bodies. Seventy-two per cent of British records of *H. rufifrons* are at less than 50 metres above sea level, but some records for England, Wales and Scotland are at sites well over 100 metres. This distribution, with two distinct types of habitat occupied, has also been noted by Hess and Heckes (2004) in a study of Bavarian mountain lakes, who singled out *H. rufifrons* as being unusual amongst water beetles on this basis. This is certainly the case in the Lake District with some quite isolated tarns on the southern fells producing this species. But how does this species get there? Does it fly? GNF and DTB must have flight-tested more individuals of this species than of all the other diving beetles put together – and not one showed an inclination to fly. Also, many have been dissected and all had their flight muscles atrophied. Flight in this species must be a rare phenomenon indeed, and likely to be limited to a brief period soon after emergence from the pupa. The beetles can more easily get around in the lowlands during times of flood, but reaching isolated pools on the fells by this method is inconceivable. Since unlike many aquatic flightless invertebrates, these beetles have no stage that might easily adhere to wildfowl or

similar, flight must be involved in colonising such isolated sites.

Although our understanding of many of the details of this beetle's biology and requirements remain rather vague, we can attempt a prescription for what might be needed for its conservation. Pool complexes are best, with some drying out completely, and none exposed to excessive numbers of cattle, with the surrounding land not intensively managed or heavily fertilised. In the past most occupied sites would have been in floodplains, but given the almost complete intensification of such areas today, the occasional occupied, isolated pools on the fells become much more important! As stated above, most sites for this species in Cumbria, and indeed elsewhere, produce few individuals, whereas relatively few sites within a region support it in high abundance. It is possible that these high-density sites are critical to the long-term survival of this species within a region, perhaps providing the only possible source of colonists in the case of a poor disperser like *H. rufifrons*.

If this beetle rarely flies, do we need to give it a helping hand, in terms of 'assisted translocation' (see Thomas, 2011)? Given the decline of this species elsewhere in the UK, we have attempted just this in recent years. One of the Lakeland populations has acted as a donor for what appears to be a successful reintroduction of the species to a former Lincolnshire site. Such reintroductions have proven quite costly in terms of consultations and the requirement for subsequent monitoring, particularly as we water beetlers are so much thinner on the ground (or water) than those who favour butterflies, dragonflies and bumble bees. It sometimes seems more desirable to use what time we have to investigate whether there really are another fifty or so natural sites for this species in the Lake District. Back to the chase!

Avoidance of acid sites means that the species tends to be most common on mildly basic geologies, and indeed its disappearance from some sites (e.g. Subberthwaite Moor) may be linked to acid deposition. At the other extreme the dearth of standing water on the Carboniferous Limestone of the Yorkshire Dales must provide a barrier to the east – though we still have hopes for some of those swallowholes!

### *Acknowledgements*

We are grateful to Robert Angus and Pascale Nicolet for access to their records, also to Stephen Hewitt of the Tullie House Museum and Phil Rispin of the Manchester University Museum for details concerning their collections, and various landowners for access to their land. The map was made using DMAP software prepared by Alan Morton, and Geoff Nobes is thanked for use of his photograph of the beetle.

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## Memories of Dotterel: Part 1

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In the days when my legs would take me wherever I wanted to go, I spent lots of time on the Cumbrian high fells looking for these elusive and enigmatic montane summer visitors.

Surprising perhaps, my first encounter with Dotterel was in fact not on the fells, but in Carlisle at Tullie House Museum in the mid-1960s, when I was attending Art College. Often, at lunchtime, or when making my way to the railway station to catch my train back to Workington, I would spend as much time as I could there, mesmerized and transfixed by the collection of stuffed birds and the history and stories that lay behind them, all lovingly positioned in habitat or nest settings by the legendary ornithologist/curator Ernest Blezard.

There was so little general information about birds in the public domain at that time. (The encyclopaedic, five-volume *Handbook of British Birds* was nowhere to be seen, and anyway cost a king's ransom.) Rare magical birds that lived in mystical distant places were thus almost beyond hope – especially if you lived in West Cumberland and had no car: I wasn't even certain whether Dotterel still existed! At that time my interest in birds was awakening in a serious way, and I had just saved enough money, and bought my first decent pair of binoculars – Swift *Audubon* 8×40s, and Peterson's *Field Guide*. But I never knew another birdwatcher then: how times have changed!

I spent a lot of time at Siddick Pond, learning how to identify Common Whitethroat, Sedge, Reed and Grasshopper Warblers. Later I caught the bus to Loweswater, visited Holme Wood on the south side of the lake, where I discovered Pied Flycatcher, Green Woodpecker, Wood Warbler and Common Redstarts. The colours of the male of the last-mentioned reminded me of my first Pantone Colour Book – I had recently become a fully qualified Printer.

The end of the '60s drifted by, and I entered the next decade; soon a married man, with a decent job, a mortgage and, more significantly, a **car** and 'responsibilities'. The last of these came in the form of two lovely daughters; sufficient time has passed to enable me to mention that they suppressed my birding activities!

It wasn't until 1977, while on holiday on the Isle of Arran, I discovered *The Dotterel*, that peerless monograph by Desmond Nethersole-Thompson (1973); I bought it, and was captivated by the stories of his personal encounters in the Scottish Highlands, but even more so by the extensive section written by Derek Ratcliffe on the history of the Dotterel in England – which in practical terms meant what is modern-day Cumbria. In particular, I was interested in where they

had bred. I loved finding nests of any birds, and had been 'hooked' as a child at Bridgefoot, where my father showed me a Robin nest on a mossy bank, so to think that Dotterel might be nesting on my doorstep was seismic news.

According to the book, they had only been found nesting sporadically in the 20th century, and then, generally only one pair. In 1959 Blezard and Ratcliffe found a nest with three eggs, then another the following year in the same place. No more were found until 1968, when Ratcliffe and other CNHS luminaries found a nest each year until 1971, all of which were on the same Pennine summit plateau, but there was no evidence of a wider nesting distribution on the high fells of the Lake District.

Historically, the first documented nest was on Skiddaw in 1784, and thereafter all of the other published records either named the specific fell, or just the general area, such as 'Buttermere Fells', 'Helvellyn Range' or 'Skiddaw group'.

Dotterel have a specific requirement for nesting; they prefer a flattish plateau and a minimum altitude of approximately of 730 m a.s.l., which restricts the number of available sites in the county, as many of our higher fells are angular with little appeal for such a specialist bird. Frustratingly, it was September when I bought the book, too late to go nesting, though the information on altitude and habitat allowed me to design a strategy for the following summer.

Most Dotterel in Europe nest in Fenno-Scandia, and due to this are late spring migrants, mostly passing through Britain during May. It was on 13 May 1978, when my wife and I, together with our beloved Border Collie cross, 'Blackie', set out for the first time onto one of the traditional sites in Buttermere mentioned in the book; one of those precious, glorious sunny days with little wind. We spend about four hours, sitting, looking, walking, uncertain of what we were looking for. We moved to the next fell, returned retracing our journey, still travelling in anticipation. Eventually, feeling deflated, we decided to give in and return to the car. Just as we were dropping off the summit onto the shoulder of the fell, Blackie paused; then, less than ten yards in front, we saw two 'shapes' running – Dotterel! I lifted my binoculars and saw, not two birds but five! Almost instantly they took flight and flew low, out of sight onto the summit, we followed, but were unable to re-locate them; nevertheless I was ecstatic, though at that time was unaware that this was only the beginning of a twelve-year 'romance'.

It was two weeks before I was able to return, uncertain of what to expect; initially for over an hour I sat and looked over what I considered to be the best ground for nesting (after all, I was an expert: I'd read the book). Eventually, to my astonishment, I noticed a male Dotterel about 50 m in front of me, walking, feeding, pausing, cocking its head sideways looking skywards. Within five minutes it started to run towards me in 'jerky' fits and starts; when it was about 25 m away it sat down!! My heart was pounding: was it really incubating? It couldn't be, surely not? Only one way to find out. I approached cautiously,

stopping to view it through my binoculars, but I was too close to focus! When I was about three metres away, he stood up, gave a soft call, dropped his left wing and ‘stumbled’ away in distraction, revealing three marvellously cryptic eggs, what joy. Swiftly I retreated, but, within moving only ten metres, he was back on the nest. I couldn’t believe my luck, or his fearlessness. During the course of that summer, I returned four more times, and followed the progress; eventually two eggs hatched and both chicks fledged.

From then on I became obsessed with looking for Dotterel. In 1980 I found a nest on a ‘new’ central Lake District fell. I told Derek Ratcliffe of my news – he of course was thrilled and was a great encouragement to me. We were to spend one memorable day together in 1984 on the northern Pennines, where together we also found a nest. But before that I had found other Lake District nests.

[John Callion has lamented that there are few photographs to document his Dotterel studies: the opportunity to include two unpublished, and now historic, images from that period (below, and on the cover) is therefore welcomed. It should also be noted that the Dotterel has long enjoyed legal protection: all of John’s work was conducted under Licence. *Editor.*]



*Male Dotterel incubating three eggs on a Lake District fell-top in the Buttermere range, 1978 – the same bird is also shown on the front cover. © John Callion  
[scanned from original print]*

## The Peregrine Falcon (*Falco peregrinus*) in Cumbria, 1996–2014

Geoffrey Horne

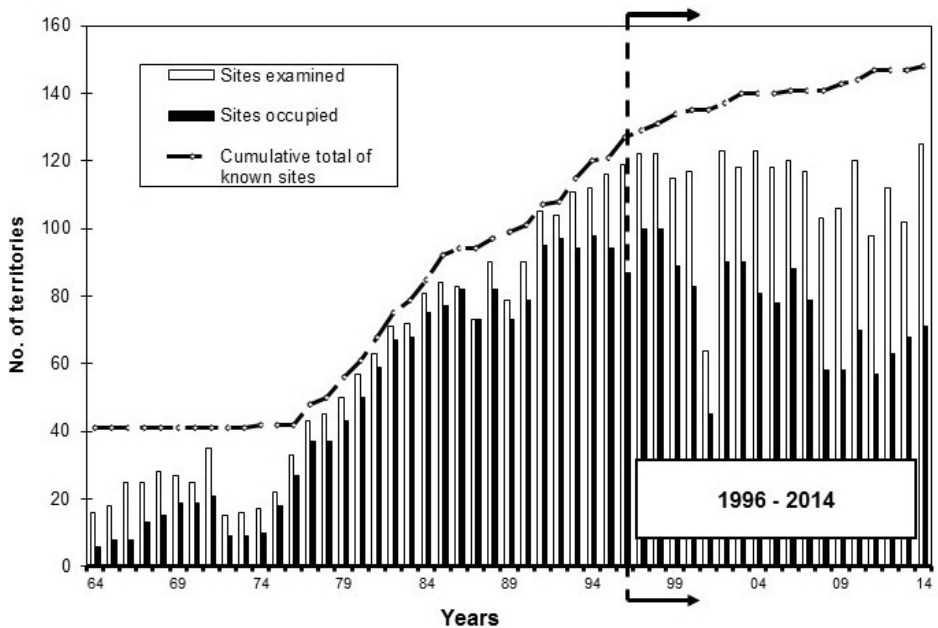
17 Yetlands, Dalston, Carlisle CA5 7PB

### *Introduction/summary*

Cumbria has been fortunate in having a long history of Peregrines as a native species, which has in turn enabled it to become the focus of much study and data-gathering over many years. As is well known, it became a key species in the documentation and unravelling of the effects of pesticides in the post-World War II era. The writer's own studies on the species have extended for half a century. The earlier period of this work was reported in the *Transactions* of this Society (Horne, 1996) – which included all the essential data then available. By that year in the post-pesticide era, what has been described as the 'super-recovery' was well under way and nearing its peak. Horne & Fielding (2002) analysed this phenomenon in some detail. The fortunes of the species from 1996 until the present day – a period of nineteen years – have been far more mixed, and the picture is now one of slow decline. Despite legal protection, human persecution remains a significant factor.

### *The wider context*

During the 1930s, Cumbria had a relatively stable population of 41 pairs at regularly occupied sites, but egg collectors systematically worked traditional sites and stole not only the first clutches of eggs, but also repeat clutches. This robbery is probably the main reason why the population did not increase during this period. The 41 pairs occupying traditional sites has been adopted as the benchmark figure on which to all future population studies were based. The main decline in the population occurred in the 1950s and early 1960s, when Derek Ratcliffe observed females breaking and eating their eggs. In 1960, homing pigeon fanciers from Wales petitioned the Government to remove legal protection of falcons in some districts. The British Trust for Ornithology (BTO) was asked by the then Nature Conservancy Council to organise a study of the distribution, districts and food of Peregrines in Britain. They invited Derek to organise their enquiry – which took place in 1961–1962. It soon became apparent that there was a dramatic decline throughout much of the United Kingdom (Ratcliffe, 1963). By 1963, the 41 Cumbria pairs had crashed to only 6, a decline of 85%. Following restrictions on the use of pesticides introduced in 1962, 1964 and 1966, signs of a recovery were noticed by 1967 (Ratcliffe, 1972). Increases from such a low level were believed to have involved movement of birds into Cumbria from other areas, such as the Scottish Highlands, where the effect of pesticides was less severe. The recovery soon reached spectacular and unprecedented proportions (Figure 1, opposite).



**Figure 1:** *Peregrine Falcon in Cumbria: the ‘super-recovery’ and subsequent changes in site occupancy through to 2014. From fieldwork data by G. Horne and co-workers.*

This had coincided with an increased interest in pigeon racing throughout the UK. The effect in Lakeland was that every Saturday morning throughout the racing season (April to September), thousands of homing pigeons were flying north, south, east and west through the county, making pigeons a relatively easy source of prey. With the number of pigeon rings issued by the Royal Pigeon Racing Association being over 1.5 million in 1971 and between 2 and 2.5 million in 1991, the proportion taken by Peregrines in Lakeland would have been minimal. It was estimated by the UK Raptor Working Group (Joint Nature Conservation Committee, 2000) that the annual number of pigeons lost to Peregrines nationally would be around 3.5% of the total birds flown, but that the effective figure may well have been appreciably lower, allowing for the proportion of exhausted birds, stragglers or those that had become feral.

By 1991, the year of the next national survey, the Cumbrian population had increased to 95 pairs. This unprecedented increase in the recovery continued by on average 3.5 new pairs per annum. With a population at these levels, birds were struggling to find territories and had to resort to ‘third class’ sites such as small riverside crags and broken rocky outcrops. The pressure on the ‘surveyors’ to keep pace with the Peregrines was similarly demanding!

### *Survey and protection*

The intention at national level was to carry out surveys at ten year intervals. Here in Cumbria, we decided to attempt to survey the population every year. In order to carry out this work, a large number of volunteer enthusiasts were approached to check every known Peregrine site in their areas at least twice and preferably three times during the breeding season. The first visit, in late March or early April, was to establish if the site was occupied, the second visit (in late April) was to see if eggs had been laid, the final visit being in the middle of June to check for signs of chicks being raised.

Access to nest ledges was an essential part of the process. Often this involved climbing crags or abseiling down to the ledges. Very few ledges could be accessed easily, and some were on crags as much as 60 metres high. This was of course a hazardous operation, which required very careful consideration of risks – both to the surveyors and the birds, and keeping (licensed) disturbance times as short as possible. Whilst this is going on, the adult birds were usually calling furiously and generally showing their displeasure by diving at the intruder in high speed mock attack. Happily, there were no serious human casualties despite the hundreds of site visits involved.

One key reason for intense crag work was to mark any eggs to deter collectors, and also to mark secretly any chicks which could potentially be stolen. As the population was now starting to recover, the stealing of eggs and young, which had been a feature of the 1930s, had started again in the early 1970s. Working at nest sites also gave many opportunities for ringing the young: over a 49 year period 1347 chicks were marked with BTO rings; of these 1157 were ringed by me personally and a further 190 by Terry Pickford, using my rings.

### *1996–2014 developments*

Statistical details have appeared in my annual reports in *Birds & Wildlife in Cumbria* (Cumbria Naturalists Union, 1995 *et seq.*). Figures 2 and 3 compare aspects of these data for the present period and the preceding 19-year interval. The proportion of sites examined annually was consistently high, the only exception being the Foot & Mouth Disease year of 2001. As Figure 2 (opposite) clearly shows, a feature of the post 1995 years has been a steady decline in the number of occupied sites, which effectively began in *ca.* 2000. The highest number of occupied sites ever recorded was 100, which occurred in both 1997 and 1998. This was 2.44 times the original ‘base-line’ figure of 41. At this time the Lake District fells temporarily held the densest recorded population of Peregrines in the world – ‘> 9 ranges per 100 km<sup>2</sup> for one cluster of 20 ranges’ (Horne & Fielding, *op. cit.*).

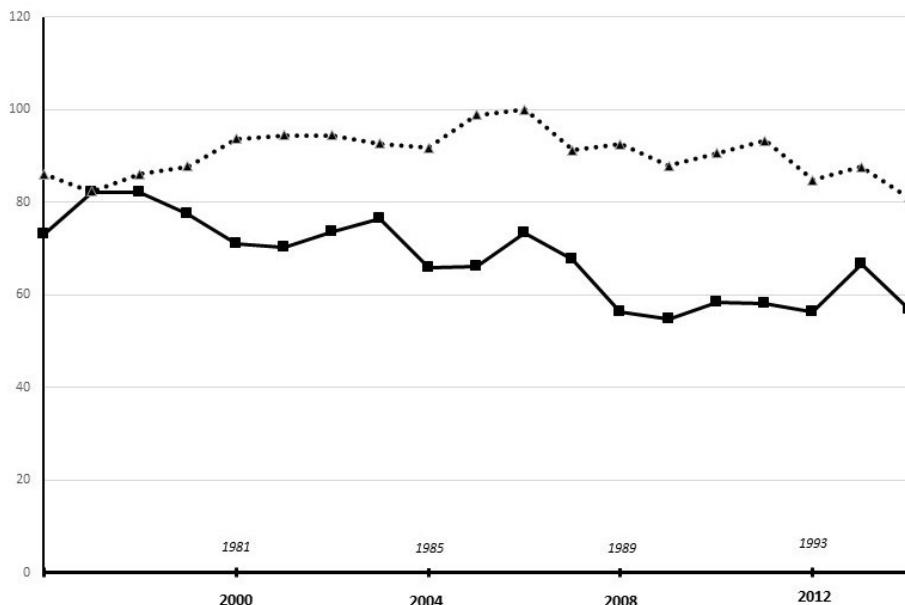
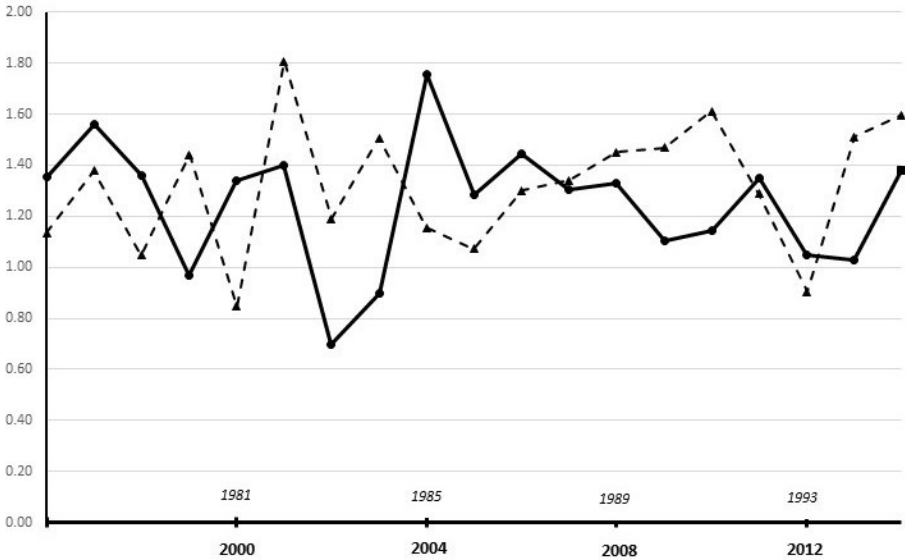


Figure 2: Peregrine Falcon in Cumbria: annual occupancy of sites as a percentage of those examined in each of the two contiguous 19-year periods: 1977–1995 (broken trace) and 1966–2014 (solid trace). From fieldwork data by G. Horne and co-workers.

The rise in the number of known breeding sites has continued – and stood at 148 in 2014 (having been 121 in 1996). This must surely be close to the maximum possible. Some ‘new’ sites have often been very transitory, and a number are no longer suitable. The only urban nesting so far known in the county was in 2006, when successful nesting occurred in Carlisle on two different steel structures. Maintenance work unfortunately put paid to this for succeeding years. Such attempts surely reflect the species’ efforts to get closer to dependable food sources, such as feral pigeons. (Elsewhere in the UK, large urban buildings have been successfully adopted by Peregrines: presumably Carlisle lacks just the right situation.)

Despite the evident decline, the productivity *per successful breeding pair* has nonetheless changed very little. The fluctuations of the graphs for 1996–2014 and the preceding nineteen years (Figure 3) are not dissimilar and presumably primarily reflect the effects of weather at critical points in the breeding season – as discussed below – and many other variable factors. Horne & Fielding (*op. cit.*) had concluded that the super-recovery expansion was in part due to high productivity, but as Figure 3 (overleaf) shows, this varies considerably, and over a long interval

is relatively stable. The mean number of young per pair for 1977–1995 was 1.32; for 1996–2014 it was 1.25. The 5.5% difference is certainly not statistically significant. 2014 was a national survey year (the others having been 1971, 1981 & 2002). In Cumbria in 2014, 43 pairs bred, with a pleasingly high mean brood size of 1.38.



**Figure 3:** *Peregrine Falcon in Cumbria: mean young per pair in the two contiguous 19-year periods: 1977–1995 (broken trace) and 1966–2014 (solid trace). Period means: 1977–95: 1.32; 1996 – 2014: 1.25. From fieldwork data by G. Horne and co-workers.*

### *Food supply*

Horne & Fielding (*op. cit.*) concluded that one of the reasons for the increase in the late 20th century had been ‘*very high density in the central core possibly due to increased food supply resulting from the channelling of prey through its valley systems*’. The UK Raptor Group’s Report (Joint Nature Conservation Committee, *op. cit.*) resulted in a recommendation to the pigeon fanciers to route their birds to fly around the Lake District rather than through it. This was taken up and birds were trained to fly new race routes in eastern England and along the west coast of Cumbria. The net result of this action was that from 2002 the amount of prey available to the Lakeland falcons was dramatically reduced. This meant that the birds were deprived of sufficient prey until the middle of May when young Rooks

flocked onto the fells for the hatch of craneflies (Tipulidae). Inevitably the reduction in food supply at the critical time when chicks were hatching impacted on brood sizes and the overall success of the species.

### *Climate and weather*

An equally challenging problem for the falcons has been poor weather in the past decade especially. Cold wet conditions in late winter and early spring invariably leaves breeding females out of condition resulting in late egg laying dates. The heavy frosts and extremely cold wet weather in late April and early May during the early years of this century has caused eggs to be chilled and failing to hatch, as well as hypothermia in newly hatched chicks.

### *Persecution*

In some areas of the county, Peregrines continue to experience heavy persecution. In the west, where pigeon racing is popular, Peregrine eggs and chicks have been destroyed, and adults have been poisoned near their nest sites. In the east, on North Pennines, sites on and adjacent to managed grouse moors have seen the disappearance of Peregrines. Losses from the Eden valley are also highly suspect. If such persecution persists, there will inevitably be no breeding in those areas.

In 2000, the Wildlife & Countryside Act (1981) was amended by the Countryside & Rights of Way Act. This gave the police and Courts greater powers to tackle wildlife crime. The possibility of a fine up to £5000 or imprisonment for up to six months, or both, may well have deterred would-be thieves. The incidence of egg collecting and chick stealing in the core breeding areas for Peregrines in central Lakeland has certainly reduced to a level below earlier times.

### *The future*

Clearly, Peregrines are unlikely to disappear from the county, despite the current slow decline: they still have a long way to go before the old pre-war level is reached. Conditions have changed and the species is resilient and adaptable – as shown by its readiness to try new sites. So I live in hope. On a personal note, my interest in Peregrines will remain undiminished, though after 49 years devotion to them my role as co-ordinator of the Cumbria monitoring effort is now at an end. It would be good to think that the ‘baton’ will be taken up by others, though the demands of such a commitment will be evident! The data gathered throughout my work has been placed as a research resource with Carlisle Natural History Society, and with the BTO.

### *Acknowledgements*

I would especially like to thank Alan Fielding for his analytical skills in the 2002 paper, and Derek Ratcliffe for continuing advice and encouragement until his

death in 2005. John Davidson gave me much valued assistance and companionship in the field, following on after Bob Buchanan's long stint. I wish also to record my gratitude to Colin Armitstead, Geoff Fryer, Derek Hayward, Terry Pickford and Paul Stott for generously and freely sharing the results of their work for other areas of the county. RSPB staff at Haweswater and Geltsdale, especially John Day, Dave Shackleton, Malcolm Stott, Stephan Ross and Dave Walker, were likewise ever helpful. Many other friends and associates throughout the north of England were generous with their help, especially the following; Peter Davies, Martin Davison, Ian Findlay, Adrian George, Robin Griffiths, John Hamer, Neil Henderson, Steve Hewitt, Ken Hindmarsh, Paul Marsden, Mike McGrady, John Miles, George Smith, Les Steadman. The Editor thanks Robin Sellers for his advice on statistics.

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### *Editor's Notes*

The trend to a greater proportion of articles per issue is seen here and looks set to continue, which does mean that reports and lists from Field Meetings may become more of a matter for the Society's website. For the first time, we have featured black and white images within the text and on the cover – primarily to test reproduction quality, and the potential for future inclusion of historic images.

### *Society News*

Our President Stephen Hewitt has gained a 2-year Pelham-Clinton Entomological Fellowship at the National Museum of Scotland, Edinburgh and we congratulate him upon this notable achievement. Although he will be away for significant periods during 2015–16 carrying out research for this post, he will attend some meetings, and the Society's AGM accepted that his Presidency should continue for at least the coming year. In the meantime he can be contacted through the Society's Facebook Group, or directly on [smhewitt@hotmail.co.uk](mailto:smhewitt@hotmail.co.uk), or via CBDC at Tullie House. Tullie House Museum & Art Gallery Trust are to appoint a temporary post to cover his (sabbatical) period of absence.

Mike Abbs has become Assistant Secretary and Gary Hedges (CBDC Recording Officer) has been appointed as a Council member. Brian Spencer has now retired from the Council after a long period of valuable service.

2015 has continued to prove a good year for recognition of the expertise of some of our members. Jeremy Roberts and Dr Rod Corner have both been awarded the Marsh Christian Trust Botany Award for lifetime achievement and outstanding contributions in the field of botanical research and conservation. (The award is run in association with Royal Botanic Gardens, Kew and was started in November 2000.)

### *Society website*

The Society's website [www.carlisenats.org.uk](http://www.carlisenats.org.uk) has been revamped and updated with much additional information, thanks largely to the efforts of Teresa Frost, Frank Mawby and Brett Carson. All the previous issues of the Society's *Transactions* bar the last one have been scanned and are now available on the website to aid further research into Lakeland's wildlife. These are all searchable PDFs – use CTRL-F or shift-CTRL-F (full search) or the search facility in the Edit menu of Adobe Reader to do so. Since most volumes of the *Transactions* are difficult to come by, this is a very useful resource. The most recent issue of *Transactions* (Vol. XII – *Cumbrian Wildlife in the 20<sup>th</sup> Century*) is of course still available to purchase from the Society for just £5.00! Robbie Brown's private publication *Lakeland Birdlife 1920–1970* is also available as a PDF on the website. Other additions include the latest (February 2015) update of Allen Armsby's *Bibliography of Cumbrian Naturalists and Natural History* and David Atty's *Checklist of Cumbrian Beetles* as well as PDFs of other local identification guides, checklists and atlases now out of print.

### *Society Library*

Recent donations include: *Journal of Bryology* Vol. **35** (2013) parts 1–4; Braithwaite, R. (1887) *The British Moss-flora*. Vols. **1–3**. London, published by the author. Both given by Peter Harris.

### *CBDC summer surveys*

This summer CBDC are inviting wildlife recorders to join dedicated recording days to increase and refresh the data for all taxa groups at interesting, under-recorded sites on private land. The four recording days will be held as follows:

27 June: **Helbeck Wood**, north-west of Brough (Stainmore) – SSSI – ash/elm wood on limestone

4 July: **High Hall Wood**, south of Wigton – ancient woodland, mixed woodland

1 August: **Duddon Valley**, Seathwaite – SSSI – mixed woodland, acid grassland, mire and flushes

5 September: **Braithwaite Moss**, Bassenthwaite Lake – SSSI – marshy grassland, rushy pasture and scrub

All CNHS members are very welcome to join any or all of the recording days, but must register in advance as volunteers for insurance purposes and to receive full meeting details by contacting Gary Hedges on 01228 618717 or emailing [recordingofficer@cbdc.org.uk](mailto:recordingofficer@cbdc.org.uk).

Remember that Full members may participate in our active Facebook group for topical wildlife discussion and news. Just log on to Facebook and search for **CarlisleNats** in ‘groups’ and click on ‘join group’ or go to [www.facebook.com/groups/CarlisleNats](http://www.facebook.com/groups/CarlisleNats).



Binocular microscope with ‘live’ digital image output to a monitor screen or to a projector via a computer. This is a very useful addition to our equipment for demonstrating small specimens of wildlife to groups of people at Society meetings, workshops and events. (Purchased with part of the grant CNHS received from OPAL.)



1. (p. 3) Black Redstart. Carlisle Airport, January 2015: roosting in parked shell of Vulcan bomber © Nick Franklin



2. (p. 5) Common Lizards, revealed hibernating under plywood sheet. Burnbanks, Mardale. (Photo: January 2015) © Wendy & David Walker



3. (p. 5) Kemp's Ridley (juvenile). South Walney, January 2015: the first Cumbria stranding of this endangered sea turtle

Scale bar : 20 cm

© Vicki Temple



4. (p. 22) Northern Deergrass at Wedholme Flow NNR, South Solway,  
2 September 2013

© Jeremy Roberts

**5. (p. 27)**

The Oxbow  
Diving Beetle  
*Hydroporus rufifrons*

© Geoff Nobes

Scale bar : 5 mm



**6a & 6b (p. 28)**

Two contrasting examples of the Cumbrian habitats of the Oxbow Diving Beetle

**6a (left)**

A fell tarn above Box-tree (SD49), 25 April

**6b (right)**

A small, partly shaded, pool beside Grayrigg Tarn (SD59), 3 November 2011



6a & 6b © Garth Foster



7. (p. 13) Surveying Dwarf Willow carpet, Stybarrow Dodd. *Inset*: gall of sawfly *Eupontania herbacea* on Dwarf Willow, Great Dodd. 26 August 2014  
© Peter Woodhead



8. (p. 13) Dwarf Willow on Millstone Grit outcrop, Great Coum, Dentdale, 14 July 2014  
© Peter Woodhead

## **Carlisle Natural History Society – Summer Programme 2015**

check website [www.carlisenats.org.uk](http://www.carlisenats.org.uk) for updates

### **3rd May (Sunday) Finglandrigg – Early Migrant Birds**

Leaders: Mike & Anne Abbs. Meet at NY282572 Haverlands layby on B5307 at 10am.

### **23rd May (Saturday) Dubwath Silver Meadows Reserve**

Leader: Dorothy Iveson. Meet at entrance to reserve (and parking) NY199309 at 10.30am.

### **6th June (Saturday) Scout Scar**

Leader: Geoff Lines (contact Marie Saag). Meet at car park (old quarry) on Underbarrow Road (note: no access from bypass) SD488923 at 11am.

### **20th June (Saturday) Gowk Bank & Butterburn Flow**

Leader: Jeremy Roberts. Meet at start of Butterburn Road NY631692 at 10.30am.

### **12th July (Sunday afternoon) Clints Quarry Nature Reserve**

Leader: Stephen Hewitt. Meet at layby near Reserve entrance NY009123 at 2.30pm.

### **Followed by: 12th July (Sunday) St Bees – Evening Auk Watch**

Leader: Frank Mawby (016973 51301) Meet at NX948145 access via private road from Sandwith at 7.30pm until about 11.30pm. Car park fee £2.

### **17th July (Friday evening) Greystoke Forest – moth night**

Leaders: Liz Still and Mike Clementson. Meet at Millfield Lodge car park NY380342 at 9.30pm.

### **8th August (Saturday) Bowness Common and south Solway rivers – bugs, dragonflies and damselflies**

Leader: David Clarke. Meet at 10.30am at North Plain Farm (RSPB) NY198615.

### **27th September (Sunday morning) Borrowdale – Fungus Foray**

Leader: Paul Nichol. Meet in Great Wood: National Trust (pay and display) car park NY273214 at 10.00am.

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