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Lakeland Naturalist



— a journal of Cumbrian Natural History

Spring 2017



Lakeland Naturalist publishes material on all aspects of the natural history of the Lake District, the wider county of Cumbria and its immediate environs

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Notes for authors:

General articles, results of personal research, news items, records and items of relevance to Cumbrian natural history and naturalists, present and past, are welcomed. Material accepted for publication must not be submitted in a similar form to any other journal or magazine.

Material offered for publication should be in the formats used in this issue. Computer files should be in rich text format or Microsoft Word and e-mailed to the Editor, or submitted on CD/DVD accompanied by a paper copy. **Bold** and *italic* may be applied to text, but no other formatting should be applied. References should be given in full at the end of the article or note, and authors are responsible for their accuracy. Authority names for species, where given, should be in full. Line illustrations should be in black ink and must be originals. Good quality photographs are welcomed where these relate to submitted text. Each photograph, figure or table should be submitted as a separate file. Whilst every care will be taken of original artwork, the Editor can not be held responsible for any loss or damage. Authors of papers will be provided with PDF format copies on request. The Editor reserves the right to submit papers to a referee, and to reject items.

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1st September 2017 & 1st February 2018

Cover:

The Heath Goldsmith Beetle (*Carabus nitens*). Glasson Moss, 27 May 2016
© Paul Kennedy

5th May (Friday evening)

Geltsdale – Birds. Leader: *John Miles*

Meet at Jockey Shield near Castle Carrock NY557557 at 6.30pm

25th May (Thursday evening)

Bowness Gravel Pits - dragonflies, birds. Leaders: *Anne & Mike Abbs*

Meet at Campfield Marsh RSPB car park NY198617 at 6pm

17th June (Saturday)

Swindale Valley, RSPB Haweswater – hay meadows and river restoration.

Leader: *Lee Schofield* (contact Marie Saag)

Meet at Swindale Farm NY522142 at 10.30am

21st June (Wednesday)

Waitby Greenriggs and Smardale NRs – plants and insects.

Leader: *Stuart Colgate*

Meet near Village Hall, Newbiggin-on-Lune NY706052 at 10.30am

2nd July (Sunday)

Honister Pass and Borrowdale – insects, etc. Leader: *Stephen Hewitt*

Meet at Honister Hause at layby (NY230136) at 10.30am (parking is limited)

9th July (Sunday)

Hay Bridge Nature Reserve – butterflies, plants. Leader: *Frank Mawby*

Meet at Carlisle College, Carlisle at 9am by prior arrangement (contact info@carlisle.nats.org.uk or phone Frank the day before), OR at Hay Bridge SD33688761 (for *sat nav* use LA12 8JG) at 10.30am. Website:

www.haybridgereserve.org.uk

15th July (Saturday afternoon)

Wetheral – riverside walk, plants. Leader: *Jeremy Roberts*

Meet at the layby on the B6263, Wetheral to Warwick Bridge road NY467552 at 1.30pm

28th July (Friday evening)

Moth Night at Wedholme Flow. Leader: *Gary Hedges*

Meet at car park about 1 mile south of Kirkbride NY238539 (*sat nav*: CA7 5LF) at 9pm. Contact info@carlisenats.org.uk to register your interest in attending.

27th August (Sunday morning)

Cliburn Moss – fungus foray. Leader: *Paul Nichol*

Meet at NY 573257 along track towards South Whinfell Farm at 10am



1. (p. 10) The mosquito *Aedes dorsalis*, male. Broughton-in-Furness, 14 August 2016
© Nigel Gilligan



3. (p. 17) Cobalt Crust fungus. The Howe, Kendal, 21 January 2017
© Tony & Heather Marshall



2. (p. 10) White-letter Hairstreak: egg on girdle scar of elm twig. Edmond Castle, nr Carlisle, 21 January 2017. *Inset*: adult high in foliage: Wetheral, 2 August 2016
© David Clarke /Jeremy Roberts



4. (p. 17) Golden Cup fungus. Thirlmere, 20 March 2017
© Sara & Russell Gomm



5. (p. 12)

The rove beetle
Stenus opticus (specimen)

Low Church Moss,
Beckermet,
9 August, 2016

image-stacked
scale bar = 1mm

© Gary Hedges



6. (p. 17)

Dark-red Helleborine

in 'clitter',
Helsington Barrows, 2016

© Ian Brodie

7. (p. 30)

The solitary bee
Anthidium manicatum

Tullie House, Carlisle,
14 June 2010

© Nick Franklin



8. (p. 31)

The solitary bee
Osmia aurulenta

Mawbray Banks,
3 June 2016

© Nick Franklin



9. (p. 31)

The solitary wasp
Ectemnius cephalotes

Lower Gelt Woods
14 July 2016

© Nick Franklin



Wildlife Reports, September 2016 to February 2017

The following are based on records submitted by CNHS members and have been forwarded to CBDC at Tullie House. Uncredited records are usually my own.

Weather: the last six months have provided some interesting weather to say the least. After a couple of relatively dry and warm Septembers, September 2016 was quite wet for the first 10 days but then settled. It was the warmest since 2006. October was the driest since 2003 and the second driest on Drumburgh records. Temperatures were near average, but the most notable feature was the prolonged period of easterly winds. November broke the mould and was the coldest since 1993, with below average rainfall and 25 ground frosts. December turned mild and rather dry and was the mildest on record and 5th driest. January continued mild and was the driest since 2001. The generally mild weather continued through February to be mildest since 1998 and second mildest on record. However, after starting relatively dry, the last ten days brought a lot of rain and windy weather. Fortunately, on the Solway we missed storm ‘Doris’.

Birds

The weather had quite marked impact on birds, bringing migrants from the east, but only a handful of **Yellow-browed Warblers** reached Cumbria. One was captured and ringed at Watchtree on 30 October: it was carrying a lot of fat and at 9.2 grams was a gram over normal weight. This was to be another **Waxwing** year – and on 7 November 50+ were feeding on Rowan at Currock Road Carlisle (DH); later there were several hundred at Dalston; there were also many other records from parts of Carlisle and Penrith, wherever berry crops were present. Small numbers were still being reported in February (RH). Likewise, there were reports of some very large flocks of **Redwing** and **Fieldfare**. **Starling** murmurations provided spectacles at Watchtree (with an estimated 50,000 at peak), Asby and Sunbiggin Tarn. (A Starling found dead at Watchtree had been ringed in SE Norway in July 2015.)

Wildfowl

Two **Whooper Swans** arrived at Siddick Nature Reserve on 5 October (HM). By the end of October good numbers were present, with about 250 by the R. Wampool near Kirkbride on 26 November. They also fed at Angerton (AA & MA). During much of February around 150 to 180 were present on grass fields either side of the R. Wampool between Kirkbride and Whitrigg. Smaller flocks were regularly present near Longtown (DJ), Oulton (RH), Easton (RH & NF), Allonby (JC), Walby (BJ) and Sandsfield (FJR). A **Mute Swan** ringed as a cygnet in a brood of four at Watchtree in 2007 seems to be well settled in at WWT Caerlaverock where it has now been captured in three consecutive years up to 2016.

Pink-footed Geese were seen passing over in early September but few seemed to

put down on the Solway. However I had 55 on fields at the back of Calvo Marsh on a WEBS count on 18 September. Thereafter, over 40 records have been submitted. From various reports it seems at least 5000 were present during from October to December with feeding flocks seen at various location from Longtown through to Allonby. For several days there were morning flights of over 1000 birds going south towards Dalston. There was an influx from Lancashire towards the end of January and by early February it seems there were at least 10,000 in the area. Whilst most were at regularly used locations *ca.* 250 were reported from Broadwath by RS on 8 January. A few **European White-fronted Geese** came with the Pinks, three with 2000 Pinks at Easton on 14 February and ten with 5000 Pinks and Barnacles around Oulton on 24 February (NF). **Barnacle Geese** seem to be taken for granted now because only two records have been received. I counted 4000, including three leucistic birds, on Kirkbride and Whitrigglees Marshes on 28 October, and AA & MA had 1200 near Anthorn on 15 October. A **Snow Goose** was seen with several hundred Barnacles by BW on 17 October.

There were once again good numbers of **Pintail**, with between 400 and 700 on the WEBS counts in November and December (MA, AA, FJM). **Gadwall** seems to be under-reported, up to thirteen regularly seen at Watchtree. A **Scaup** was at Longtown Ponds 4 January (DJ) and nine were on Castle Carrock Reservoir on 13 February (JM). **Long-tailed Duck** sightings included a male at Sunbiggin Tarn from 26 to 29 October (BR), a male off Drumburgh on 4 November (HM), and up to four at Grune seen regularly during November (JM, DH, FJM). **Smew** included a female at Siddick on 16 and 19 January (DJ & PE). A drake **Mandarin** was briefly seen by RS on the R. Eden at Wetheral on 4 December.

Other marsh and water birds

Little Egret is now common around the coast; the inland records add interest, with Sunbiggin Tarn the furthest inland on 4 December (BR); there were also two records from Dalston at Rose Castle 28 December (DJ); along the River Caldew near Dalston on 9 January (AR) and one in Rickerby Park on 17 December (DAI). A **Great Crested Grebe** was at Wet Sleddale dam on 3 October (TW). A **Water Rail** was seen and heard quite often at Watchtree when the Starling roost was present; they are more common than records suggest.

Waders & Gulls

A single **Dotterel** was on Harter Fell on 18 September (TT). **Little Stint** records began from 13 September when a juvenile and an adult were seen by PRW at Bowness Railings; another was at Anthorn on 26 October (DJ) and there have been a number of sightings over the winter, mostly by NF, the latest being on 10 February near Port Carlisle. A **Pectoral Sandpiper** was seen by AM in the Lyth Valley on 12 September.

Curlew Sandpiper is a regular passage wader often seen at Bowness Railings at high tide. PRW recorded a juvenile there on 13 September. A more unusual winter record of this species was from the River Eden near Cargo on 27 January (DS). **Ruff** included one at Campfield Marsh on 2 September, but the Walby flash held eight on 1 December and ten on 1 January (DJ). **Jack Snipe** are probably more abundant than records of this very secretive wader suggest: knowing where to find them is the secret and they only flush when nearly trodden on, and usually drop again within 40 metres. On 23 October, I flushed two on Wedholme Flow, on 9 November one at Watchtree and 15 November another on Grune Point. On 15 January NF flushed five along the River Esk upriver from Longtown and on 25 February CM flushed four whilst flail-mowing vegetation at Thornhill Meadows. DC was surprised to flush a **Woodcock** from dead bracken in open moorland above Loo Gill, Hartside at 350m on 19 November. A **Greenshank** was on Drumburgh shore on 10 November (PRW) and at Glasson Point and Port Carlisle during January and February (CA, NF). The first two **Green Sandpiper** were at Linstock bends on River Eden 16 October (PRW); up to six were on a splash near Wetheral, and two on the Walby flash during January and February (PRW, HM, RH, NF, CA, DJ, RG). **Common Sandpiper** had two late migrants at Kirkandrews on Eden on 3 October (DJ). A 32-year-old colour-ringed **Common Gull** was seen by RS at Dalston during September; it was ringed as a *pullus* in Norway, 10 July 1974. **Mediterranean Gull** was reported from Bowness-on-Solway (JI), Silloth (RH), Siddick (HM) and Allonby (JC) from September to January. **Iceland Gull** was noted at Bowness-on-Windermere on 24 February (NF). 150 **Sandwich Terns** were seen by RH on Grune Point on 11 September.

Raptors and owls

Red Kite records, all of singles, were of one flying over Grune towards Anthorn on 3 October (HM); 11 November Crosby Ravensworth Moor (BR) and on 19 February one over Warwick Bridge (RA). A young male **Hen Harrier** was seen from Jockey Shield over Geltsdale on 13 September (JM); a 'ringtail' was being harried by crows at back of Border Marsh on 16 October (FJM); another was hunting Shap Fell on 20 October (JW) and one hunting fields near Cardurnock on 28 November (DJ). **Kestrel** (33 records) and **Buzzard** (59 records) were the two most regularly reported raptors on the CBDC database. **Merlin** is possibly under-recorded, with only three records, from Border Marsh on 16 October (FJM), Campfield Marsh on 28 November (DJ) and Glasson Moss on 16 January (CA). **Peregrines** hunt Wedholme Flow regularly, usually for Teal, and they are often seen along the Solway shore hunting the wader flocks. **Barn Owl** (with eight records) were well down on the same period last year (AA, GH, DJ, FJM, SM, JM, TW) – but daytime hunting has been much less this season; one from GH was a road casualty and a notable one was from TW of a bird that flew out of a shed on Shap Fell on 5 October.

Grouse and allies

Grey Partridge had coveys of 18 at Foulbridge, 29 September (RPD), eight at Watchtree on 11 October and a remarkable 18 at Cargo on 8 November (RH); a road casualty was noted by RG near Glasson on 3 January.

Passerines

A late juvenile **Cuckoo** was seen on Bowness Common on 13 September (PRW). **Green Woodpecker** sightings in the north of the county were from JC of one at Mawbray on 29 October and a card submitted by non-members M & M Storey of a juvenile on their garden feeder at Blackford Farm in September. A **Great Grey Shrike** at Soddy Gap was reported by KH on 15 November and 21 January. The records for **Marsh Tit** are from H & AM of one seen regularly from September to December at Cragg Howe, Lyth. The single **Willow Tit** record, on 14 February along the north margin of Glasson Moss (RH), perhaps indicates the plight of this bird. **Swallows** were reported regularly through October, with three November records: on 4th at Kingstown (CA), 7th at Drumburgh (HM) and 18th at Carlisle Airport (SG). **House Martins** were moving down the coast at Allonby in some numbers on 3 October (JC). A late **Willow Warbler** was ringed at Watchtree on 11 September. Two **Chiffchaffs** were seen at Grune Point by RH on 9 October. A male **Blackcap** was feeding on fallen apples at DH's Dalston Nursery on 27 November and another was in DI's garden in Etterby, Carlisle on 6 January. A late juvenile **Reed Warbler** was still at Watchtree on 11 September (FJM). **Stonechat** winter records came from Bewcastle 25 October (DJ), Campfield Marsh 16 November (DJ), Thornhill Meadows 25 February (CM). The last **Wheatear** record of the season was from RH at Grune Point on 9 October. **Rock Pipit** is perhaps under-recorded because there are usually single birds in the salt marsh creeks on Calvo Marsh through the winter; CA saw one at Glasson Point 25 February. **Brambling** records are of mainly small numbers in a wide variety of locations, the earliest record was of one flying over Jockey Shield on 3 October (JM) and RH reported several at Talkin Tarn on 15 November; the last record we have is of three at feeders at Great Salkeld on 5 February (JT). I saw 14 **Twite** on Border Marsh on 13 November, 40 on Grune Point on 15 November and at least 50 on Calvo Marsh on 15 January. SH noted a flock of about 50 **Snow Buntings** on Great Dodd, 17 February.

Amphibians and Reptiles

Common Frogs were very busy spawning, with lots of records following the first reported spawn seen by DS at Prospect on 17 February. A late **Adder** was seen at the Common in Finglandrigg Wood on 17 October (CA) and one was out again on 26 February (CM).

Mammals

Of 22 **Hedgehog** records, 13 were road casualties. They were active through to late October but a surprise was to see one in our garden at Kirkbride on the evening of 29 November. **Otter** brought five records, the latest being from DJ of two at Kirkandrews on Eden on 15 February. **American Mink**, two records from GH both road casualties on 25 October on the A68 and on 5 September on the A689 at Crosby-on-Eden. **Grey Squirrel** records now far outnumber **Red Squirrel** sightings. There are seven Reds on the database, of which two were road casualties from GH at Miltonrigg Wood on 25 October and at White Moss Common on the A591 on 19 September. Live animals were at Distington (JR) 8 October. On surveys in Finglandrigg Wood NNR, a single one was recorded on 25 October and again on 5 November. MC saw one at Cockermouth on 3 December and one was at Jockey Shield in JM's garden on 6 December. The database shows 14 **Brown Hare** records with a good geographical spread across the north of the county.

Butterflies etc

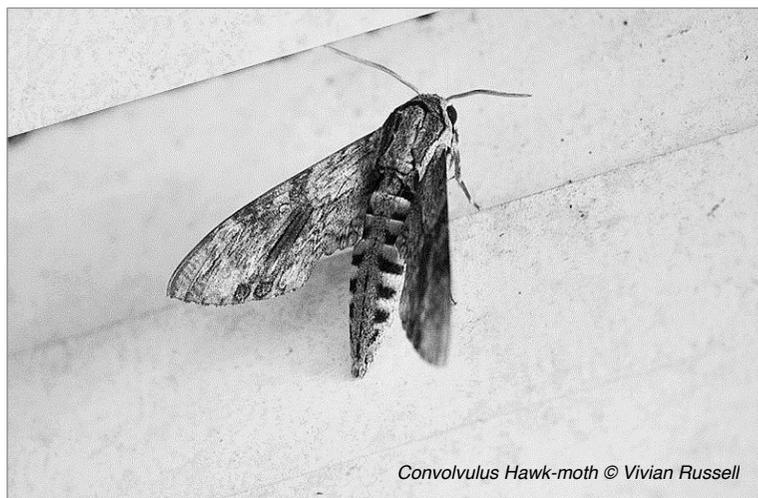
Red Admirals were reported frequently through the autumn and into November with the last north Cumbria record from DC at Cumwhitton on 15 November, whilst in the south MC recorded one on 27 November at Grange-over-Sands. However, the mild weather in January brought one out at Rogersceugh on 25 January (DJ). There were five records of **Peacock** from October, the last being from LS at Bowness-on-Solway on 24 October. There were numerous **Painted Lady** records in September and seven in October, the last being at Cumwhitton on 21 October (DC). **Small Tortoiseshell** numbers were reasonable from south Cumbria, and notably on 5 November from MC in his garden at Grange and an exceptional late one on 22 December at Broughton in Furness from NG. In the north DC felt they were unusually scarce; the last sighting was by VR at her Silloth Bee Garden on 25 October. The most frequently reported butterfly of the autumn was **Speckled Wood**, again mostly from the south of the county, with nine records from the north, the last from DC at Cumwhitton on 28 October. Other locations were Bowness-on-Solway (LS), Dalston (AA), Oldside, Workington (JC), Grune Point (RH), Glasson Moss (AA) and Watchtree (FJM). A late **Common Blue** was recorded at Oldside on 15 September (JC). **Small Copper** records were few: DC had at least three in his Cumwhitton garden on 27 August and there were 14 other records in September/October in north Cumbria: RH recorded one at Grune Point on 9 October whilst in the south NG saw one at RSPB Hodbarrow on 12 October. The **Comma** is now quite often recorded in north Cumbria and the last was from CR at Wreay on 8 October; MR saw one at Holehird Gardens, Troutbeck Bridge on 7 November. The last **Green-veined White** of the season was seen at Bowness-on-Solway on 1 October (LS). **Convolvulus Hawk-moths** occurred widely in the

UK in autumn, and VR encountered at least four, variously at Silloth and Skinburness, 17–20 September – see below.

Recorders

AA: Anne Abbs. MA: Mike Abbs. CA: Colin Auld. RA: Roy Atkins. JC: John Callion. MC: Martin Chadwick. DC: David Clarke. RPD: Richard Dixon. PE: Phil Evans. KH: Keith Hamilton. DH: David Hickson. RH: Robin Hodgson. SH: Stephen Hewitt. NG: Nigel Gilligan. SG: Sam Griffin. NF Nick Franklin. RG: Russell Gomm. DAI: Dorothy Iveson. DJ: David Johnston. BJ: Bob Jones. H & AM: Heather & Anthony Marshall. FJM: Frank Mawby. CM: Chris Mawby. SM: Shelagh Mawby. HM: Hedda Moore. JI: John Ireland. JM: John Miles. JR: John Read. BR: Brian Redhead. FJR: Jeremy Roberts. MR: Mo Richards. AR: Ann Robinson. CR: Craig Robinson. VR: Vivian Russell. RS: Rob Shaw. JR: RS: Richard Speirs. LS: Liz Still. TT: Tony Tipling. JT: John Turner. TW: Tony Williams. PRW: Peter Wilson.

Frank Mawby



Convolvulus Hawk-moth © Vivian Russell

Field Meetings 2016

The following report was held over from 2016. Species lists from some Field Meetings will appear on the Society's website: carlisle.nats.org: view in the 'Public Resources' menu.

17 July 2016: Southern Uplands: Carrifran/Talla Leader: Tim Frost

We were welcomed by Tim Frost, a Society member and forester whose long association and familiarity with the site, gained whilst working for the Border Forest Trust, made him the ideal leader for the day. Tim outlined the history of the formation of the Trust which had come about following a conference in 1993 which had highlighted the fact that less than 0.01% of the Southern Uplands was wooded. A 'Wildwood' group was formed in 1996 and after looking at the pollen records, took up the challenge of attempting to restore a range of woodland cover and native species, reminiscent of the Southern Uplands as they were before felling, burning and grazing by domestic animals had modified the hills and valleys following the end of the last great ice age. In January 2000 some 1600 acres of the Carrifran valley was purchased and work by a dedicated band of friends and supporters commenced.

We walked from the car park along a well maintained narrow path through young, planted, broadleaved woodland, displaying a wide variety of native species labelled with sturdy weatherproof markers, en route for our first stop at an ancient, circular stone-walled sheep-fold from which the whole of the valley could be seen. By the time we reached this superb viewpoint we had seen Aspen (*Populus tremula*), Alder (*Alnus glutinosa*), Hazel (*Corylus avellana*), Sessile Oak (*Quercus petraea*), Wych Elm (*Ulmus glabra*), Blackthorn (*Prunus spinosa*), Birch (*Betula* sp.), Bird Cherry (*Prunus padus*) and more. Splashes of colour were provided by stands of Rosebay Willowherb (*Chamerion angustifolium*) in open glades of coarse grasses and rushes. Before us the whole valley was laid out providing the ideal opportunity to see its main features, from the tumbling Carrifran Burn to the crags and screes at the head of the valley. Our leader had taken the trouble to visit the site the night before and to set out a portable (actinic) moth trap in a sheltered position amongst bracken and low scrub. The contents of the trap included beautifully fresh specimens amongst which a Lesser Swallow Prominent, a Lempke's Gold Spot, a Dusky Brocade and a Light Emerald provided good material for the photographers in the group. Other moths identified at the time included Barred Straw, Dark Arches, Smoky Wainscot, Silver Ground Carpet and True-lover's Knot.

Thereafter, we all descended through dense bracken towards the valley floor where a wide, stoned track led up the glen. Here the Nationally Scarce plant bug *Orthotylus virens* was present on the planted Bay Willow (*Salix pentandra*). This is the first record of the bug in Scotland, having been first added to the British list by F.H. Day

in 1917, from Cumwhitton Moss. Bird song was scarce, though Wrens were ‘ticking’ in the under-growth. Since the purchase of the valley, birds have been monitored carefully. By 2012, Woodcock, Great Tit, Skylark, Blackcap, and Garden Warbler were well established. Ring Ouzel was recorded in 1998, but last seen in the valley in 2000. Black Grouse have also been known to lek on the site but numbers have not been good in recent years.

The valley roadway made easy, pleasant walking through increasingly wet and peaty ground dominated by mire species. Purple Moor Grass (*Molinia caerulea*), Cotton and Deer sedges (*Eriophorum* and *Trichophorum* spp.), expanses of Common and Soft Rush (*Juncus conglomeratus* and *J. effusus*) were relieved by colourful Bog Asphodel (*Narthecium ossifragum*), Ragged Robin (*Lychnis flos-cuculi*), Knapweed (*Centaurea nigra*), Marsh Thistle (*Cirsium palustre*), Meadowsweet (*Filipendula ulmaria*) and Lady’s Bedstraw (*Galium verum*). The track and its margins were flushed by diverse drainage features supported Butterwort (*Pinguicula vulgaris*), Round-leaved Sundew (*Drosera rotundifolia*), Lousewort *Pedicularis sylvatica*, Selfheal (*Prunella vulgaris*), Lady’s-mantles (*Alchemilla* spp.) and a variety of sedges, notably Star Sedge (*Carex echinata*), and small rushes such as Toad Rush (*Juncus bufonius*).

On the drier parts, Common Bird’s-foot-trefoil (*Lotus corniculatus*), Colt’s-foot (*Tussilago farfara*), Heath Bedstraw (*Galium saxatile*), Tormentil (*Potentilla erecta*), Harebell (*Campanula rotundifolia*), Herb-Robert (*Geranium robertianum*) and Yarrow (*Achillea millefolium*) added to the interest of our walk.

The sun was out and Ringlet and Small Heath butterflies were flying, along with Clouded Border, Common White Wave and Yellow Shell representing some of the smaller day-flying moths. Shallow puddles on the track had provided ephemeral opportunities for amphibians. Common Frogs were frequent and we paused for some time to watch both adult and larval stages of Palmate Newt swimming in the shallow pools. The newt tadpoles, although still without legs, were nearly as big as some of the adults.

We were now moving into more open ground as we slowly ascended the valley. The Carrifran Burn was a tumbling ‘torrent’ below us. The party began to spread out exploring the diversity provided by rocky outcrops, small streams and flushes. The Burn itself ran between rocks with deep pools, small waterfalls, shingle and pebbly banks. We were surprised to find extensive patches of Sea Campion (*Silene uniflora*) growing amongst the boulders and on the shingle banks.

The day was still fine as we gathered together again to eat our lunch. The scenery was superb and we were entertained by the occasional appearance and calling of Peregrine Falcons on the crags above us. Two members made their way to the foot of the high rocky wall forming Raven Craig at the head of the valley. They reported Starry Saxifrage (*Saxifraga stellaris*), Lesser Clubmoss (*Selaginella selaginoides*),

Beech Fern (*Phegopteris connectilis*) and Roseroot (*Sedum rosea*) growing amongst the scree and at the foot of the crag, and the scarce lichen *Dermatocarpon intestiniforme*. The plan for the afternoon was to make our way up the side of the Burn to Holly Gill where we too hoped to find some of the more montane species. Early on, we encountered a willowherb growing by the streamside which was identified as Chickweed Willowherb (*Epilobium alsinifolium*), a plant new to many of us.

From now on the ground became rougher as we left the end of the stoned track and made our way between heathy banks and boulders. The vegetation changed and we encountered increasing amounts of Cottongrass and Deergrass cover interspersed with wet *Sphagnum* flushes. In these wetter areas we found Cross-leaved Heath (*Erica tetralix*) replacing Bell Heather (*Erica cinerea*) and many flowering spikes of Heath Spotted-orchid (*Dactylorhiza maculata*). We were in an area where planting had been difficult and we noticed that such saplings as were present were protected by short plastic rings (about 20 cm high) designed to prevent vole damage. There was much evidence of voles and more than one sighting of dark reddish-brown voles, probably Bank Voles, scuttling into holes amongst the rocks. The better-drained edges and grassy margins of Holly Gill supported quite extensive stands of Bilberry (*Vaccinium myrtillus*) which, in the absence of any sheep grazing, was producing a fine crop of fruit. Holly Gill is a deep, narrow cleft with dripping rock faces, higher on the north side. There was a lush growth of woodrush, grasses, Roseroot, Mountain Sorrel (*Oxyria digyna*), yellow composites, Hard (*Blechnum spicant*) and Parsley (*Cryptogramma crispa*) Ferns, and dense curtains of larger ferns.

There was much to admire by the deep gill, and we rested, listening to the song of a Blackcap which kept well hidden in some low willows before we turned around and headed back down the valley past the bothy towards the car park. The afternoon was still fine and the occasional Green-veined White and Small Heath were still flying. One member was lucky enough to have a good view of a Small Pearl-bordered Fritillary, whilst others photographed a colourful orange and black sexton beetle and a dung beetle. We did not see much evidence of mammals, having looked in vain for Otter spraints on suitable boulders in the burn. In addition to the voles, we had noticed many molehills and one member reported finding a weasel spraint on a stone by the pathway.

The party took some time to disperse from the car park, always a good sign. It had been a fascinating and instructive day, and we could not have failed to be impressed by the dedication and vision of the Border Forest Trust, and by the beauty of the site. Much of the success of the day was due to the foresight and preparation of Tim Frost who led us and who received our grateful thanks.

Russell Gomm

Notes and Records

The scarce mosquito *Aedes dorsalis* (Meigen, 1830) a recent Cumbria record

I photographed a distinctive-looking mosquito in my garden at Broughton-in-Furness (SD210870) on 14 August 2016. The site was once a wet meadow, and is only some 0.5 km, and downwind, of the Duddon estuary. My expert contact, Dr Tony Irwin, provisionally identified it as *Aedes dorsalis*, an apparently very uncommon species. (Like all male mosquitoes it lacks the infamous skin-piercing mouthparts, and has beautifully plumed antennae and very long and ornate labial palps – Plate 1). Two weeks later I found and caught a second specimen, which enabled the identification to be confirmed. Judging by the records on the NBN Gateway, it appears very localised: there is a previous Cumbria record, in 1934 – from a site only 2km from my find. The nearest records until this year are from Cheshire (inland) and are otherwise coastal and very southerly or south-easterly. There has been a 2016 record from Leighton Moss (Lancs). Possibly this species is yet another in the suite of invertebrates that find northerly refuges in the mild microclimate of the Morecambe Bay area. The association with salt-marshes and other saline areas is a further factor.

Aedes dorsalis is one of many species regarded as ‘data deficient’ – a categorisation that means its true status is uncertain. Jolyon Medlock, national organiser of the Mosquito Recording Scheme has commented ‘... *not a common species ... very similar to the more common Aedes caspius but despite checking hundreds of caspius we rarely find any dorsalis* ... [A. dorsalis] *has been found in both freshwater and saline aquatic habitats, but certainly seems to be able to tolerate saline waters, which cannot be said for all mosquito species ... [It appears to be] localised to warmer areas*’

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The White-letter Hairstreak – new sites revealed

The spread of this species in the county is becoming increasingly noticed, and notes in this journal, have already confirmed its presence in north Cumbria. I was however, somewhat amazed when last year I received a database of Cumbria records of this species, covering fieldwork by Ken Haydock and Jill Mills in 2011, and 2014–2016 inclusive. They had found the species in thirteen tetrads in the county, most of them in the north and east. In the northeast of the county alone, in 2014–2016, newly revealed sites/1 km squares for the butterfly are: Dalston (NY3649), Warwick-on-Eden (NY4656), Near Hayton (NY5058), Gelt Woods (NY5357), Talkin (NY5457),

Lanercost (NY5563 & NY5663), Gilsland (NY6366). These are in addition to previously documented discoveries at Wetheral (NY4753) and Low Gelt Quarry (NY5258). Amazingly, most of their 24 records – 18 in fact – were of eggs! The difficulty of noticing adults flying high in the tree-tops pales to nothing compared to finding the pinhead-sized egg, usually singly laid on *Ulmus* twigs where most of them are surely too inaccessible anyway. They mentioned one particular tree at Edmond Castle (NY55) and after a long search I managed to repeat their find – almost certainly the single egg they had located on this large tree. The branch was some ten feet up, though it was possible to drag its tip to a lower level. David Clarke and I managed eventually to keep the branch, and ourselves, still enough to record it (Plate 2). This is a salutary lesson in tracking of this elusive butterfly, which clearly is far more widespread than most observers have so far been able to discover.

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The ground beetle *Carabus nitens* Linnaeus, 1758 discovered at Glasson Moss

On 27 May 2016 a single adult of this Nationally Scarce predatory ground beetle, now assigned the English name Heath Goldsmith beetle, was found on a path near a woodland edge in Glasson Moss (NY235595) by Paul Kennedy (cover illustration). According to the CBDC database and the NBN Gateway, this is only the second Cumbrian record since 2010 and it is new to the site. Although there are single records for this attractive species at two other lowland peatland sites nearby – Bowness Common (2006) and Wedholme Flow (1994) – *C. nitens* is primarily a montane species in Cumbria, typically found in moorland in both the Lake District and the North Pennines, with a particular preference nationally for the edge of *Sphagnum* bogs. Indeed, Paul himself had photographed the species at 600m in the Caldbeck fells (NY3134) only a year previously (18 April 2015). County coleopterist John Read (1995) described the habitat when he found the beetle at Devoke Water (SD153967) in April 1995. Since the species is distinctive, partly diurnal and conspicuous where it occurs, it may be surprising that it is recorded so sparingly at well-visited, known sites such as Geltsdale (last noted in 2010) and Haweswater (last noted in 2007). However, *C. nitens* is apparently easily overlooked, being localised by both phenology (it appears in April, May and June), and by its specialist habitat.

C. nitens has been described as strongly decreasing in many areas of its distribution and endangered in central Europe as a result of the loss of heathland areas and habitat quality (Assman & Janssen, 1999). Given that populations are potentially severely fragmented in the UK, all extant Cumbrian sites may be important for its conservation.

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The rove beetle *Stenus (Tesus) opticus* (Gravenhorst) (Coleoptera: Staphylinidae) from West Cumbria

On 9th August 2015 I found one specimen of this very small (3mm long) all-black rove beetle while attending a CBDC recorders day meeting at Low Church Moss (SSSI) near Beckermeth. The beetle was discovered while searching for water beetles in a *Sphagnum* pool by the edge of a small area of willow carr at NY015057. Because the beetle could not be immediately identified in the field it was collected and taken home. When examined under the microscope it proved to be a male. In order to make a positive identification the specimen (Plate 5) was dissected and eventually determined by using the key, description and illustration of the male genitalia provided by Lott & Anderson (2011).

S. opticus is a mainly wetland species and has been recorded from a variety of habitats which includes fens and marshes, carr woodland and well vegetated swamps and lakeshores. It is thought that the beetle may possibly occur in the debris around the roots of marsh plants and in general marsh litter (Hyman & Parsons, 1994).

S. opticus is a rare beetle in Britain and is currently designated Nationally Scarce, i.e. a species thought to occur in 16-100 10km squares of the National Grid. It has a scattered distribution in Britain and has been recorded from various sites, mainly in the south, south-east and west of England, and from several vice-counties in Wales. It has also been recorded from West Galway in Southern Ireland (Denton, 2013).

This appears to be a new beetle for Cumbria and the first record for VC70 Cumberland. It is not listed in the check-list of Cumbrian beetles (Atty, 2015) and there are no specimens from the county in the general Coleoptera collections held in Tullie House Museum. (The one specimen in the F. H. Day collection at Tullie House was collected at Wicken Fen by the well-known 19th century coleopterist W. E. Sharp.)

Acknowledgements

I wish to thank Gary Hedges (Cumbria Biodiversity Data Centre), and Dr Jonty Denton for their assistance during the preparation of this note.

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Four invertebrate species new to Cumbria from Sandscale Haws NNR

I visited Barrow on 6 August 2016 and, having a few hours to spare, decided to have a look at Sandscale Haws NNR and sample one of the dune slacks there for aquatic/wetland invertebrates. It was my first visit to the reserve. Most of the slacks were dry, being mid-summer, but one looked promising: a large shallow pool at SD184749, fringed with spike-rush, marsh cinquefoil, water mint, lesser spearwort and various other plants. I recorded a total of 57 invertebrate taxa, mostly water beetles (25 spp.) and water bugs (16 spp.). Full details have been passed to Cumbria Biodiversity Data Centre.

I was surprised, later, to find that four species had apparently not been recorded previously in Cumbria – I could find no earlier records held by either Cumbria BDC, the NBN Gateway or the relevant national recording schemes. The four species are the water beetle *Rhantus frontalis*, the water bugs *Notonecta viridis* and *Hesperocorixa moesta*, and the money spider *Prinerigone vagans*.

The water beetle is listed by JNCC as Nationally Scarce. It is found sparingly in Britain from Dorset to Angus in east Scotland. The two water bugs appear to be extending their range in Britain and are currently known from as far north as the Scottish Borders and Dumfries & Galloway, respectively. The money spider is near the northern limit of its British range in Cumbria. It was recorded in Scotland in 2016 for the first time from two sites in Dumfriesshire.

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Breeding Dotterel in Cumbria in 2016

I well remember the 7th May 1989: walking the western fells, I neared the summit of my first hill of the day. It was a fine spring day, a little high cloud and no wind; I was anticipating a brew at the summit cairn and a chance to have a breather and enjoy the

view, when my attention was caught by three birds running around on the ground in front of me. They were of course Dotterels; instantly recognisable, and the first I had ever seen. For those who have an interest in both fell walking and birds, to see anything other than a Meadow Pipit or maybe a Wheatear on our sheep-dominated tops always sets the heart racing. A week later, under similar circumstances, I stumbled quite by chance upon another individual on a fell some distance away, and with that, I was hooked. Now I eagerly await late April to early May every year, and rarely miss the opportunity to head out in search of Dotterel. Over the years since then I have amassed quite a few sightings of passage trips in spring, and a single bird, possibly on return passage, another chance encounter on 19 August 2012.

At one time the Dotterel was a rare but regular breeding bird in Cumbria, its English stronghold in recent years, but it has not been proven to breed in the County since 1994 and on the Lakes fells since 1989. There has also been a decrease in breeding throughout the UK (which in effect means in the Scottish Highlands) of 57% between 1987/88 and 2011, from 980 to 423 breeding males, along with a contraction in the species' geographical range and declining numbers at core sites (Hayhow *et al.*, 2015). Against this background, I had long since abandoned any ambitions of ever finding breeding birds in Cumbria. Given an absence of over twenty years, the Dotterel was, as far I was concerned, effectively extinct as a breeding bird in the Lakes.

On 28 April 2016, I stood on the summit of the same fell as where I had my first encounter on that May day twenty-seven years earlier, and watched a trip of eight birds wheel around high in the sky, then drop down, and fly past me, barely three feet above the ground. I was thrilled with this sighting as I had never witnessed them actually arriving and always assumed they would come from a southerly direction. But these didn't, they came high and from the north. Ten minutes later it was snowing hard, and I had to retreat, unable to find them in the white-out. Two days later, I returned to find four on the ground there, running around and feeding between the fast melting snow patches. Presumably they were part of that group, but it is also possible that they were new birds as the site is a regularly-used one. I was unable to get out on to the fells in May, so with that, I assumed I had finished my search for Dotterel for the year.

In early July I made my annual pilgrimage to one of the traditional historic breeding sites. I set off under leaden skies, up to a cold and misty plateau with little expectation of much more than a routine fell walk. Ten minutes of walking in swirling mist only served to confirm this. Then, to my astonishment and delight I saw a plover, upright and alert. I had to eliminate Golden Plover, but I knew, even before I lifted my binoculars to see the white supercilium, that the pot-bellied bird in front of me could only be one thing; it was a Dotterel. From a brief inspection, it was a male, and what's more from its stance, it was alert: it was looking-out for something. The passage Dotterel I am used to seeing are busy feeding and don't usually do this; it was new behaviour to me, and within a few seconds, I saw what it was looking out for; a fluffy,

miniature Dotterel running around on the dewy moss, much closer to me, then another, slightly larger, but still very obviously a Dotterel chick. I couldn't believe it; confirmed breeding of Dotterel in Cumbria after all these years! To say I was excited is an understatement. As I left the fell, feeling rather pleased with myself, I realised that the information would have to be shared but also required the utmost sensitivity; not a comfortable feeling. A fellow Dotterel enthusiast visited the same fell a week later, and found the birds on the point of fledging. Another week after this, I returned myself, but after an extensive search of the whole fell top, I failed to locate them. This of course does not mean they weren't there or nearby, but my assumption is that they had fledged successfully and moved on.

From the state of development of the chicks, it seems likely that the eggs were laid at the end of May, which is normal for this species. Unusually though, the two chicks appeared to be at different stages of development, and the events that could have led to this can only be guessed at, but are likely to be the result of slightly impaired development; however, the smaller chick did not bear any apparent weakness. Even a week later the two chicks still showed this apparent age differential, though were perfectly healthy and at the point of fledging. How this came to be remains a unexplained, as does the fact of their breeding in The Lakes in 2016 after such a long apparent absence.

With a bird as scarce and enigmatic as the Dotterel, speculation is inevitable, as we do not really know where trips are bound for after they visit the Cumbrian fells in spring; it is quite possibly Scandinavia as well as Scotland. No spring migrant Dotterel has ever been ringed in Cumbria, nor have any birds ringed elsewhere ever been reported in Cumbria. That the Cumbrian fells provide a break in their migration is established but its significance is unknown, and they are surely under-reported.

The whereabouts of this year's female once she left the male to incubate her eggs remains mystery; where the male went with the two young once they had fledged can only be guessed at; and the same can be said about whether and where they will return to next year. In fact, we still know very little about the Dotterel; why it is declining in Britain and the importance of Cumbria in providing a break in their migration. Possible reasons for the overall decline in the UK have been suggested (Hayhow, *op. cit.*), including habitat changes, nitrogen deposition and climate change, but these relate to the breeding population, not to birds on passage. If future developments in satellite tracking can be extended to the Dotterel (at the time of writing, the devices are too heavy for the bird to carry), then like the now-famous BTO Cuckoos, a lot would be learnt about their movements and this could help us identify the causes of their decline, and what might be done to redress it.

The Dotterel has certainly brought me and my fellow enthusiasts great pleasure over the years, and our Cumbrian fells would be very much poorer without the annual

appearance these delightful birds. I am indebted to John Callion and John Strowger for providing help and guidance in producing this Note.

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Cumbria-ringed Peregrine Falcon breaks UK longevity record

In the late 1960s I was asked by Derek Ratcliffe, who was the National Peregrine Survey Coordinator, to monitor the Peregrine population in north Cumbria. At the same time, I undertook to ring as many Peregrine chicks as I could, to find out where they went to, how far they travelled and their condition when found. Initially I only used British Trust for Ornithology rings, but in late 1980s I was asked to take part in a scheme to fit PIT rings on the chicks. PIT is short for Passive Integrated Transponder. The ring has a phial with a microchip attached to it. The idea is that the transponder is placed on the nest ledge and the chip number is read when the bird lands on the nest ledge. This allows the ringer accurately to record nest site fidelity as well as the bird's age. I have recently been informed by the BTO of a 'recovery' of a bird I had ringed as a nestling in the Lake District on 7 June 1994. The bird, a male, was detected on a transponder at a site near Lochmaben, Dumfriesshire on 1 May 2016. This means that it was still at large. Its age at that date was 7999 days (21.9 years) post-ringing, but actually 21.97 years, since at the time of ringing it was about 23 days old. This may be the greatest recorded age of a Peregrine in the wild (or even in captivity) – it has certainly broken the UK longevity record. The fact that it was a male is also unusual; old individuals tend to be females, which being larger than males tend to survive longer on the whole. In the *Peregrine Falcon*, 2nd edn. (1993) Ratcliffe states that several falconers' birds have lived more than twenty years and twenty years in the wild is a likely life span, but quotes no specifics. My bird had a recovery history of some interest, having been 'controlled' on two previous occasions, both these also being by a transponder device. These had both been in the breeding season at Lochmaben, on 9 May 2009 and 5 May 2012 respectively. This suggests that the bird had spent much of its long life at low altitudes, within easy reach of relatively plentiful food supplies, which may help explain its longevity. At the 1st May sighting it was only 63km from its ringing site. From the recoveries it appears to have had a long period of site fidelity.

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Cobalt Crust fungus (*Terana caerulea* (Lam.) Kuntze) from the Lyth valley, Kendal

On 21 January 2017, whilst hedge laying, we found a fine example of this very striking crust fungus on some dead blackthorn brash in the hedge bottom (Plate 3). The site was on private land at SD45408801 just south of The Howe in the Lyth valley. Although the principal national fungi databases are not currently showing Cumbria records, this appears to be a fourth site for the county. All previous records in the CBDC database are from Wendy Nelson and David Benham, and all within 10km of the present record. It was first recorded in the county in 2013. The species is mainly known from the southern half of the UK.

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Golden Cup fungus (*Caloscypha fulgens* (Pers.) Boud.), new to Cumbria

On 20 March 2017 we found a dozen or so examples of this Red Data List fungus in moss at the base of a stone wall alongside the road on the west side of Thirlmere (NY313155). Sara recognised the species from her regular use of the British Mycological Society's *Facebook* site. She realised that the find could be important and submitted the record with pictures to the BMS, where David Champion identified it from the photograph. It was also posted on the CNHS website and Paul Nichol was happy with the identification too. This is the first Cumbria record. We revisited the site on 25th March and counted 43 fruiting bodies.

The genus *Caloscypha* is monotypic, containing only *C. fulgens*, which can be distinguished from the similar Orange Peel Fungus *Aleuria aurantia* because it discolours blue as it ages or after it is handled (Plate 4). It also tends to fruit in the spring whereas *A. aurantia* is an autumn fruiter. Paul Nichol has since commented that in Europe *C. fulgens* is usually found in mountain areas with moss, and with a suspicion of being associated with Silver Fir – which would fit nicely with the Thirlmere location – though there are quite a few records of associations with other trees in lowland England. It is apparently rare, with around 30 records on national databases at present. Records are spread widely (including Lancashire and one Scottish record) so possibly the species is under-recorded. It is classified as 'Vulnerable/D2' on the national Red Data List of fungi because of its apparently small population.

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Observations on the Dark-red Helleborine (*Epipactis atrorubens*) at Helsington Barrows SSSI, south Cumbria

The Dark-red Helleborine is a nationally scarce plant with a significant proportion of its English populations concentrated on the limestones of south Cumbria. One of the

largest concentrations occurs on the higher part of the National Trust's Sizergh Estate, which forms the southern end of the limestone ridge of Scout Scar some 2km SW of Kendal. The land, as with much of the Sizergh Estate, has been included in a recent extension to the Lake District National Park. The Trust ownership entails a large enclosed part of the fell called Helsington Barrows, an area with SSSI status. This enclosure, grazed by cattle, holds around six species of orchid, including the Dark-red Helleborine (as well as other interesting plant species associated with the limestone pastures). In 2011 we noted over 1500 plants of this species, and 1300 in 2013.

Two issues stimulated our interest. The area contains a number of larch trees and we wondered whether there might be a strong correlation between the orchid and the ectomycorrhizal fungal association with the larch roots. Secondly, we were aware that current guides to orchids – perhaps quoting earlier publications (e.g. that of Stewart *et al.*, 1994) – continue to suggest that 'Bishop Middleton quarry in Co. Durham holds 2,000 or more plants, probably more than all the other British sites put together' and that '... British and Irish populations may still be in decline.' (Harrap & Harrap, 2005; Harrap, 2106).

In July 2016 we undertook a more systematic survey of Helsington Barrows, with a larger number of volunteers (ten) including two local expert botanists, Wendy Nelson and Alan Gendle. We counted early in the flowering season to try and see the number of potentially flowering plants before potential grazing by deer or other mammals removed flowering shoots, and also to try and understand the spatial relationship between the plant and larch in order to better inform future management of the site.

The plant is distributed in around fifty patches spread over approximately a square kilometre of sloping hillside, but recording the occurrence in limestone 'clitter' (a low scree of limestone fragments, Plate 6), open grassland or under trees, mainly larch, was not easy. On that day we counted 1,859 plants, of which 910 were in flower or bud. However, the correlation between plants with buds and flowers and their location under larch proved to be low.

Allowing for those near the edge of trees or in groups of plants partially under or out beyond the expected spread of tree roots, some 70% were clearly away from larch and other trees – in open ground. Whilst clear felling all the larch from this SSSI would be a difficult task, felling of some small groups of larch trees associated with a small number of orchids may be worth the experiment – in order to try and ascertain if the removal of larch really does have an adverse impact on the orchid population.

Given the knowledge that a similarly large population occurs nearby on another area of Morecambe Bay limestone, and that a number of other sites around the Bay also have smaller numbers of Dark-red Helleborine, it can be conjectured that our local area may hold between 5,000 to 6,000 plants. As such, the National Trust is responsible for a significant portion of the English population of this fascinating

flower. The Trust has been provided with our data.

Rather by accident, we may have solved a further question about the biology of the plant. The Harrap publications (*op. cit.*) claim that no information is available about the length of time between germination and flowering of this species, a matter which is always an interesting issue with orchids. A late season visit in 2014 may have been the reason as to why some seeds found their way, via walking boots, into one of our gardens. In 2016 a single plant occurred and, had a small mammal not beaten us to the plant, it is likely it would have flowered within two years from germination.

Our thanks go to John Hooson, National Trust Regional Ecologist for advice.

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Survey of Dwarf Willow (*Salix herbacea* L.) distribution in Lakeland: 2012–16

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The current survey developed out of a Cumbria Wildlife Trust ‘Upland Juniper’ project, which surveyed another arctic-alpine species reported to be declining due to a combination of climatic and anthropogenic factors. An introduction to the survey and its methodology appeared in a previous issue of this journal (Woodhead & Woodhead, 2015). This included results for the initial three years of survey work from 2012–14 inclusive, and discussion of the findings was set in the context of reports of ongoing climate change and its possible cumulative effects on vegetation in the Cumbrian uplands. A total of 124 ‘Wainwright Tops’ were surveyed during this period, with Dwarf Willow found on 72 of them (58%). Many of these single ‘Tops’ supported multiple stands of the Willow, in both of its habits, as turf carpets and as linear growths within rock crevices. Thus, on the Skiddaw summit ridge, approximately 12 sites were recorded; on the Crinkle Crag ridge, 20 separate stands were found; on the Bowfell north ridge, 21 discrete sites were identified. To some extent these reflect the accuracy and assiduousness of the surveyors at these sites. However, the overall picture of Dwarf Willow frequency on the summits and ridges has been shown to vary from one or two plants in a rock crevice to substantial areas of carpet habit, intimately mixed with its associated competitors. Some of these have similar tolerances, such as the dwarf shrubs: bilberry; cowberry; crowberry; and occasional ling heather. Also present within such a ‘consocieties’ would often be fescue grasses, *Nardus* (mat-grass), stiff sedge, fir and alpine club mosses, and the woolly hair-moss, *Racomitrium lanuginosum*.

The survey continued for the next two years over the 2015 and 2016 seasons. Primarily the focus was on completing the survey of all Wainwright summits over 700m. In addition, re-visits were made to existing stands to test the replicability of the survey methods and to record greater detail concerning the apparent health of the Dwarf Willow plants. Local rock type and associated substrate conditions were recorded, where possible. Surveyors were rewarded with finding a further fifteen Fells with the Dwarf Willow occurring in both of its habitat forms, i.e. in carpet form, often covering several square metres, amongst a dense turf of its regular consocieties; also in rock crevices of perhaps 3–10 cm wide, particularly in the andesite lavas of the Borrowdale Volcanic Group (BVG) of rocks. This added a further 15 Wainwright Tops and 35+ records of individual stands to the database. A summary table of data from the five years of survey is presented in Table 1 (page 24), using the format of the seven ‘Pictorial Guides to the Lakeland Fells’ by A. Wainwright, plus his ‘Guide to the Outlying Fells’.

At this point it is helpful to review the original purposes underlying the Project, in order to make some assessment of overall success. The initial choice of an individual species distribution survey, was based on a desk-study of literature and real-time observations of upland shrubs in Cumbria, which recorded the restricted distribution of this specific, relict species of the arctic-alpine flora. *Salix herbacea* was said to be in retreat due to environmental changes and the cumulative effects of intensive land management in the uplands. It has disappeared from southwest England, and the Peak District, during the 20th Century, but reportedly is surviving and even thriving in North Wales (Harold, 2015), and is present on the Isle of Man, below the summit of Snaefell at c. 610m (*pers. comm.* P. Bullard). It is still widely distributed throughout the uplands in Scotland.

The reasons why the decline of a single species should concern us include the negative consequences of a reduction in biodiversity, specifically in the uplands. Dwarf Willow is described as a ‘Canary species’ in that it may serve as an indicator for wider montane scrub communities, both plant and animal. The species achieved a form of national recognition when identified by the National Trust for Scotland as one of the arctic-alpine species which is disappearing from the Highlands of Scotland. (reported in *The Guardian* newspaper, August 2016). Derek Ratcliffe (2002) quotes it as indicative of good Dotterel habitat on the Lakeland Fells, a theme taken up by John Callion (2015) in his ‘Memories of Dotterel’ articles in this Journal, volume 3, in which he reflects on the ‘Dotterel years’ of the past. Thus, John Muir’s ecological maxim of ‘everything being connected’ is exemplified time after time, and Dwarf Willow provides us with an excellent ‘canary’ role, if only we can read the signs.

One important function of vegetation in the uplands is to provide ground-cover, which stabilises the substrate and helps to prevent erosion. Since the dramatic storms of winter 2015-16 in Cumbria, the spotlight has been focused on whole-catchment studies with a view to ‘slowing the flow’ of water from the uplands. This has identified the crucial importance of Natural Flood Management (NFM) as an effective tool in regulating water run-off in the relatively short term, for which the effects of increased growth of montane scrub species may well be a practical means of delivery. Conservation efforts in the uplands are now understood to produce significant benefits in downstream catchments.

Directions for future studies

In addition to plotting the distribution of Dwarf Willow, observation of the microhabitat where it occurs (and possibly even more significantly, where it might be expected to flourish, but could not be found) was designed to identify a series of environmental factors which might be limiting of its distribution and growth: these are factors which characterise the high fells of Lakeland. They include underlying rock type; both physical and chemical characteristics of the substrate; soil pH and nutrient

status; physical factors of altitude, aspect, degree of exposure, water content and relation to snow lie and drainage; anthropogenic factors of trampling and grazing by domestic and wild animals.

Dwarf Willow is host to a specific sawfly, *Eupontania herbacea*: little is known about the details of this association, apart from the insect's life-cycle, its purported pollination of *Salix* plants and the highly visible insect galls through the growing season. By recording the presence of these distinctive red galls, a simple distribution of this insect can be plotted by proxy. In addition to the sawfly, swarms of small, black Diptera (family: *Empididae*) have been observed crawling over flowers of the willow in late May. It is natural to conjecture that these insects provide a fertilization 'service' to the plants. However, more detailed study of the willow and its associated invertebrates might provide interesting data on the role of sexual reproduction in its survival.

The occurrence of fungal fruiting bodies has been recorded adjacent to Dwarf Willow stands on many of the Lakeland Fells, particularly prevalent on Grasmoor and Crag Hill in the north-western Fells: these are also frequent with other Willow species, but quite certainly have ectomycorrhizal associations with Dwarf Willow, a mutualism which would enhance its growth and development on the poor soils of the fell-tops. Hewitt (2016) describes the occurrence and discusses the significance of these 'montane fungal communities' on the fell-tops, which are equally subject to the effects of climate change. As might be expected of natural vegetation, the Dwarf Willow can suffer from parasitic fungi: a fruiting body of the rust *Melampsora alpina* has been recorded from leaves on a couple of widely separated Wainwright Fells.

The Snowdonia Society reports healthy stands of Dwarf Willow in North Wales, describing it as a 'charismatic talisman, a remnant of the wild tundra' (Harold, *op. cit.*). Harold also links the occurrence of Dwarf Willow turf with his observations of Dotterel in the Welsh mountains: the one is indicative of the other in their occurrence. He also describes and discusses the mutual associations of alpine fungal species with montane shrubs and with Dwarf Willow in particular. The role of Dwarf Willow as a 'Canary species' is considered in the context of upland conservation. It would be rewarding, and no doubt instructive for comparative studies to be carried out between Cumbria and North Wales.

Having raised the prospect of comparative studies of Lakeland Dwarf Willow with its occurrence and performance in North Wales and also in the Scottish uplands, what are some of the practical research possibilities for the future? One of the major 'limiting factors' regulating growth and spread of Dwarf Willow, as with its associated dwarf-shrub species, is that of excessive grazing and trampling pressure. In order to test this hypothesis and to monitor the recovery of dwarf shrub vegetation, grazing animals would need to be excluded, and vegetation performance monitored using a series of fixed quadrats. Measurement of local, environmental factors would

provide comparative evidence of other regulators of growth and development of the dwarf shrub association, and would test its ability to recover from excessive grazing and trampling pressures. If the effects of accelerating climate change can be shown to have a significant detrimental impact on the growth and survival of Dwarf Willow, then there may be little that can be done to promote its survival in the Cumbrian Fells. At the least, with a comprehensive database of its distribution, we are now in a more favourable position to chart its inevitable decline. The Dwarf Willow has veritably become a latter-day 'canary in the uplands'.

As concluding remarks, I quote Derek Ratcliffe on the subject of pervasive environmental change: '...plants show a greater inertia [than birds or invertebrates] in responding to climatic change, but the tiny populations of relict mountain species must be increasingly disadvantaged as conditions become warmer. Some plants may be able to ascend to higher levels, or to lose only the lower-level part of their populations, and thus survive; but for the species already confined to the highest altitudes, there is nowhere else to go'. (Ratcliffe, 2002).

Acknowledgements

My grateful thanks go to the Survey Team of volunteers for continuing to walk the Lakeland Fells systematically, while recording the location, site details and pictures of Dwarf Willow over the five years of the project. Particular thanks are due to Sylvia Woodhead, David Benham and Betty King for their indefatigable survey work and for having 'the nose' for locating this dwarf tree on the high summits and ridges of Cumbria; also to Peter Bullard, the Director of Cumbria Wildlife Trust and his staff for continuing support and inspiration.

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Table 1

Final data of Dwarf Willow records from 2012-16 survey seasons									
	Eastern Fells	Far-eastern	Central	Southern	Northern	North-western	Western	Outlying Fells	
No. of Wainwright Tops surveyed	29	23	10	25	12	18	22	10	
No. with <i>Salix</i> present	18	12	5	17	6	10	15	4	
Null record	11	11	5	8	6	8	7	6	
Highest altitude (m.)	888	790	734	940	926	850	889	580	
& fell name	Catsycam	High Raise, High Street	High Raise, Langdale	Scafell Pike	Skiddaw	Grasmoor	Pillar	Black Combe	
Lowest altitude (m.)	698	607	701	600	656	650	629	535	
& fell name	Seat Sandal	Tarn Crag, Longsleddale	Pavey Ark, Langdale	White Maiden, Coniston Fells	Bakestall, Skiddaw	High Spy	Fleetwith Pike	Buckbarrow	
Turf carpet habitat	16	2	4	13	5	10	14	1	
Rock crevice habitat	10	10	4	13	2	4	2	3	
<i>Eupontania</i> sawfly galls present	11	1	0	2	1	7	10	0	

Subspecies of the Dunlin (*Calidris alpina* (Linnaeus, 1758)) found in Cumbria

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As a breeding bird the Dunlin (*Calidris alpina*) has a circumpolar distribution extending south to about 60°N (which passes close to the southern tip of Greenland, the southern tip of Finland and Anchorage, Alaska) except in the Western Palearctic where it reaches as far south as 50°N (southern England) (Cramp & Simmons, 1982). Most are long distance migrants with winter quarters lying between 50°N and the equator. A total of nine subspecies are recognised (del Hoyo *et al.*, 1996), three of which are on record as having occurred in Britain, that is, are included in the British List (Harrop *et al.*, 2013). They are:

C. a. schinzii: breeds in south-east Greenland, Iceland, Ireland, Britain, Baltic States, southern Scandinavia and southern Finland.

C. a. alpina: breeds in northern Scandinavia and north-west Russia,

C. a. arctica: breeds in north-east Greenland.

Blezard *et al.* (1943) record the presence of the first two of these in Lakeland. There is no question that *schinzii* occurs in Cumbria, for this is the form that breeds in the county. The basis for the inclusion of nominate *alpina* is not given by Blezard *et al.* (1943) but presumably relates to biometrics (nominate *alpina* averages slightly larger than *schinzii*, but note that females average slightly larger than males, so correct sexing is essential if reliable subspecies assignments are to be made) (Cramp & Simmons, 1982). They differ also to a certain extent in their breeding plumage (*e.g.* Baker, 2016) but for all practical purposes are identical in the winter months. The purpose of this report is to summarise the evidence for the occurrence of nominate *alpina* in the county based on biometrics, and for the occurrence of nominate *alpina* and *arctica* based on ringing recoveries.

Evidence from biometrics

The Tullie House Museum collection has four Dunlin skins labelled *schinzii*, three of which were collected in the breeding season, and twelve, all from the non-breeding season, identified as nominate *alpina*; further details are shown in Appendix 1, together with measurements of wing and bill length. Based on the measurements of museum skins given in Cramp & Simmons (1982), the wing length (WL) ranges of these two subspecies can be summarised as follows:

Males*C.a.schinzii*, WL 105 – 123 mm (n = 226)*C.a.alpina*, WL 109 – 120 mm (n = 55)**Females***C.a.schinzii*, WL 109 – 124 mm (n = 171)*C.a.alpina*, WL 112 – 123 mm (n = 30)

From these figures it will be clear that only a small proportion of birds can be identified safely as to subspecies on wing length alone. Note that though the figures seem to suggest that some very long wing length birds can be identified as *schinzii*, this is an artefact of the disparate sample sizes. Blezard *et al.* (1943) do not state on what basis they assigned subspecies but they probably used the biometric data in Witherby *et al.* (1941) who state that males over 112 mm and females over 116 mm are nominate *alpina*, and that males under 110 mm and females under 115 mm are *schinzii*. However, these are based a much more limited sample of skins and are not reliable as a means of separating *schinzii* from nominate *alpina*.

Other biometric measures (bill, tarsus and tail length) for nominate *alpina* are similar to those of *schinzii* (Cramp & Simmons, 1982) and do not provide an adequate basis for separating the two subspecies. Note, however, the very long bill length (36.6 mm) of bird (9), which is above the upper limit of 36 mm the latter quote for a sample of 30 female nominate *alpina* skins. The likelihood that this was genuinely an example of *C. a. alpina* appears high.

Evidence from ringing recoveries

C. a. alpina – There are six recoveries on file referable to this subspecies, three (one nestling and two newly fledged chicks) from Finnmark, the most northerly province of Norway, and three from the Murmansk Region of north-west Russia; further details are given below. Note that four of these birds were handled in Cumbria during the main migration periods (two in August and two in May), and two in midwinter (both in January). Limited though the data are, it seems reasonable to conclude that *C. a. alpina* is both a passage migrant and winter visitor to Cumbria, and this is consistent with what is known more generally of the movements and wintering areas of this subspecies (e.g. Wernham *et al.*, 2002; del Hoyo *et al.*, 1996).

BB55501	2	14 Jan 1970	Newbiggin, Cumbria
	R	11 Aug 1970	Murmansk Region, Russia (ca. 69°48'N, 31°36'E)
NOO	3	16 Aug 1977	Finnmark, Norway (70°09'N, 28°52'E)
DA00720	R	7 May 1978	Walney Island, Cumbria
NOO	3	29 Aug 1977	Finnmark, Norway (70°09'N, 28°52'E)

DA01504	R	7 May 1978	Walney Island, Cumbria
NOS	1	21 Jun 1999	Finnmark, Norway (71°05'N, 28°13'E)
8768442	R	14 Aug 1999	Grune Point, Silloth, Cumbria
SUM	4	28 Jul 1970	Murmansk Region, Russia (69°49'N, 31°34'E)
S152478	X	19 Jan 1977	Walney Island, Cumbria
SUM	2♂	18 Aug 1970	Murmansk Region, Russia (69°49'N, 31°34'E)
S428003	R	27 Jan 1971	Cark, Cumbria

C. a. arctica – There is just a single recovery of this subspecies in Cumbria, as follows (curiously this appears to be the only ringing recovery between north-east Greenland and anywhere in Britain):

DKC 4 1 Jul 1975 Germania Land, Greenland (76°45'N, 18°45'W)
8116176 R 7 May 1978 Walney Island, Cumbria

The first column in these recoveries shows the ringing scheme code (*DKC*, Copenhagen; *NOO*, Oslo; *NOS*, Stavanger; *SUM*, Moscow; no code, London) and ring number; second column, first row, the age on ringing (1, nestling; 2, age unknown but full-grown; 3, first-year; 4, adult), second row the recovery circumstances (R, trapped; X, found dead); third column the dates of handling, and fourth column where handled.

The *arctica* race is known to winter in north-west Africa (del Hoyo *et al.*, 1996) and the date of handling of this single Cumbrian recovery is consistent with it being a passage migrant here.

Conclusions

Although the biometric data of birds taken in Cumbria show some separation between the small sample of *schinzii* birds and the slightly larger sample of what have been claimed to be nominate *alpina* in terms of wing length in both males and females, the measurements do not provide a very convincing demonstration that nominate *alpina* occurs in Cumbria based on the wing length ranges quoted in Cramp & Simmons (1982), particularly given that no account has been taken of the possible presence of *arctica* birds, which are intermediate in size between *schinzii* and nominate *alpina*. The ringing recoveries on the other hand show unequivocally not only that birds from northern Scandinavia and north-west Russia (subspecies nominate *alpina*) occur in Cumbria but also that at least one bird from north-east Greenland (subspecies *arctica*) has been found here. From the dates of handling in Cumbria nominate *alpina* is both a passage migrant and winter visitor to the county; *arctica* birds on the other hand are probably just passage migrants. These conclusions parallel closely the findings concerning the subspecies of the Redshank (*Tringa totanus*) occurring in Cumbria

(Sellers, 2016) and highlight the value of ringing recoveries in resolving questions about which subspecies occur in a particular area.

Acknowledgements

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Appendix 1. Dunlin skins in the Tullie House Museum collection

Listed in order collected; details from labels attached to the skins, except the biometric measurements which were made by the author; WL, wing length; BL, bill length.

C. a. schinzii

- (1) Skin No. 50-1936.276, ♀, Skinburness, Cumberland, 12 Sep 1927, collector unknown. WL 104 mm, BL 34.0 mm. [This is a very short wing-length for a female and it seems likely that the bird was incorrectly sexed on dissection.]

- (2) Skin No. 12-1938.20, ♀, Moricambe Bay, Cumberland, 23 Jul 1932, E. Blezard. WL 112 mm, BL 31.7 mm.
- (3) Skin No. 12-1938.19, ♂, Moricambe Bay, Cumberland, 23 Jul 1932, E. Blezard. WL 112 mm, BL 30.3 mm
- (4) Skin No. 12-1938.23, ♂, Knock Fell, Westmorland, 6 Jun 1933, E. Blezard. WL 110 mm, BL 28.8 mm.

C. a. alpina

- (5) Skin No. 36-1984.118, ♀, Silloth, Cumberland, 11 Dec 1884, H.A. Macpherson. WL 121 mm, BL 36.0 mm.
- (6) Skin No. 24-1984.185, ♂, Solway Firth, 27 Nov 1895, L.E. Hope. WL 120 mm, BL 32.7 mm
- (7) Skin No. 24-2984.184, ♂, Burgh Marsh, Cumberland, 4 Dec 1903, T.L. Johnston. WL 109 mm, BL 27.5 mm.
- (8) Skin No. 32-1917.192, not sexed; probably ♀ on biometrics, Windermere, Westmorland, 1 Jan 1909, E.B. Dunlop, WL 119 mm, BL 30.4 mm.
- (9) Skin No. 32-1917.193, ♀, Windermere, Westmorland, 1 Jan 1909, E.B. Dunlop. WL 120 mm, BL 36.6 mm.
- (10) Skin No. 50-1936.277, ♂, Flookburgh, Lancashire, 27 Oct 1911, M. Garnett. WL 118 mm, BL 25.6 mm.
- (11) Skin No. 32-1917.194, ♀, Hedge Howe, Windermere, Westmorland, 5 Feb 1912, E.B. Dunlop, WL 116 mm, BL 35.3 mm.
- (12) Skin No. 50-1936.271, ♀, Skinburness, Cumberland, 18 Sep 1918, M.Garnett. WL 117 mm, BL 31.5 mm.
- (13) Skin No. 50-1930.275, ♀, Flookburgh, Lancashire, 27 Feb 1922, M.Garnett. WL 117 mm, BL 34.4 mm.
- (14) Skin No. 12-1938.21, ♂, Burgh Marsh, Cumberland, 2 Sep 1932, E. Blezard. WL 110 mm, BL 28.3 mm.
- (15) Skin No. 10-1965.ii, ♀, Long Newton Marsh, Cumberland, 27 Jan 1963, A.Allison. WL 122 mm, BL 35.9 mm.
- (16) Skin No. 10-1968, ♂, Long Newton Marsh, Cumberland, ♂, 27 Jan 1965, A. Allison. WL 116 mm, BL 31.5 mm.

Recent expansion of aculeate Hymenoptera in north and west Cumbria

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Robinson (2002) first asked the question ‘Are bees and wasps moving north into Cumbria?’. It has become evident in recent years that several species of bees and wasps do indeed appear to have expanded their range into the north and north-west of the county. Most of these species are either entirely new to Cumbria, or had only been noted previously in the south-west of the county.

The focus of some of these new arrivals has been the coastal area of north-west Cumbria, while the Carlisle area has also provided several interesting records. However, some of these records are inevitably due to the location of active recorders in this previously under-recorded area of the county. This northward spread of aculeates has obviously been a gradual process, but it was in 2010 that I first noticed different species cropping up in north Cumbria.

On 16 July 2010, I found the small mason bee *Hoplitis claviventris* in Carlisle while walking home from work. This was a tremendous surprise as I knew that this bee was not normally found north of Kendal or Eskmeals, and it is rare in the north of England. There were no further records, however, until Vivian Russell found it nesting in her Skinburness garden in a ‘bee hotel’, in late May 2014. It has continued to thrive there, nesting in each of the last two years, but has not been found away from its actual nest site.

Regular checking of the gardens of Tullie House Museum, Carlisle, also paid dividends in 2010, with another mason bee, *Osmia caerulescens*, found nesting there. Until 2010 there were only two north Cumbria records: Penrith in 1999 and Drumburgh Moss in 2001. This bee is now established in a number of locations in the north of the county and continues to thrive.

The very attractive Wool-carder Bee, *Anthidium manicatum* (Plate 7), had also been slowly spreading northwards in Cumbria. It was recorded as far north as Penrith in 1997, then next located, in 2010, in the Tullie House grounds. This bee is unique in that it uses the garden plant Lamb’s-ear (*Stachys byzantina*) and other plants of the family Lamiaceae, from which to card hairs which it then compresses to form the cell walls and plug of its nest (see Robinson, 1999). It is worth looking out for wherever Lamb’s-ear is found, as it has continued to spread and is now present at many sites in north Cumbria.

Additionally, in 2010, I found the cleptoparasitic bee *Epeolus cruciger* at the nest site of its host, *Colletes succinctus*, in Bowness-on-Solway Reserve in late August. This colony subsequently became overgrown and I have not recorded it since, despite regularly checking colonies of *C. succinctus*. It has only been found on one occasion

since, again by Vivian Russell, at Wolsty Banks, Silloth, in 2015. Before 2010, as with *Hoplitis claviventris*, this bee had not been found north of Sandscale Haws, in south-west Cumbria, where it was discovered, new to the county, in 2003.

The rapid spread of the Tree Bumblebee *Bombus hypnorum* since the first UK records in 2001 made a north Cumbria record almost inevitable – as proved to be the case on 19 May 2011 when I reported the species from the Tullie House gardens in Carlisle (Franklin, 2011). It has since become extremely widespread in the county.

There was nothing unusual recorded in the next few years, but in 2014 Vivian Russell made the exciting discovery of *Osmia aurulenta* (Plate 8) at Wolsty Banks, just south of Silloth. This beautiful bee, known previously from Walney Island, Sandscale Haws, Drigg Dunes and the Sellafield coast, utilises snail shells to nest in, packing the entrance with cut leaves to protect the nest cell. Following up on Vivian’s discovery, I found colonies of this bee at Mawbray Banks and Allonby in 2016, and I suspect it may nest in other places around the coast, where Bird’s-foot Trefoil and empty snail shells are found.

Among several interesting species found in 2015, I was pleased to find a single *Stelis punctulatissima*, a cleptoparasite of *Anthidium manicatum*, in Tullie House’s gardens. This might have been anticipated, with the appearance of the host bee a few years earlier, and also because it had been recorded in Dumfries & Galloway as long ago as 1974. However, the only other Cumbrian records were in 2004 at Troutbeck, near Windermere, and Allithwaite, near Grange-over-Sands. It had not been recorded since so it was still a surprising record.

Another unusual visitor located in 2015, was *Andrena fuscipes*, a late-summer heather forager. Vivian Russell found a male at Wolsty Banks near Silloth, the first record since one in 2005 at Gowbarrow, Ullswater. This had been the only record since the 1940s.

Also in 2015 Vivian noted the first Cumbria record of the solitary wasp *Sapyga quinquepunctata*, at *Osmia* nests in a ‘bee hotel’ in her garden in Skinburness. This attractive species is a cleptoparasite on *Osmia* nests, and was presumably investigating the *Osmia caerulescens* nests in the garden. It has now become a regular feature in the garden, with several males and females present, but has yet to be recorded elsewhere in the county.

Another wasp that appears to be working its way north is one of the *Ectemnius* species, *E. cephalotes* (Plate 9), recorded twice in the late 1990s, as far north as Derwent Water, but not since. This is a conspicuous, large black and yellow wasp that collects flies, and nests in dead wood, but is hard to distinguish from other species in its genus. This may have limited records, but I have found it in both 2015 and 2016, in the Hayton area of north Cumbria.

The warming of the climate is presumably one of the reasons for the expansion northwards of aculeate ranges, and there is no reason to suspect that this will cease.

Several other species are close to the Cumbrian border or are restricted to the south-west of Cumbria. It will be well worth keeping an eye out for *Colletes cunicularius* or *C. floralis* on the coast. Both are only currently known from south-west Cumbria (though the latter is a northern bee known mainly from Scotland). Additionally, the sister species of the cleptoparasitic *Epeolus cruciger* mentioned above, *E. variegatus*, is currently known in Cumbria only from the south-west, but is likely to spread north along the coast.

A recent colonist in the UK, *Colletes hederæ*, the Ivy Bee, will almost certainly be found in south Cumbria this year, as it is spreading north rapidly along the coast of England, and was recorded just across the border at Jenny Brown's Point in north Lancashire, in October 2016. I would expect it to continue its rapid expansion northwards, and reach north Cumbria within a couple of years.

Although north Cumbria may never be able to compete with the numbers of aculeate species found in the warmer southern counties of the UK, it currently seems to be at the tip of the expansion zone of many southern species, and this makes it a fascinating time to be researching the bees and wasps of the area.

Acknowledgment

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[*The publication in 2015 of Steven Falks' Field Guide to the Bees of Britain and Ireland (British Wildlife Publishing) was a major step forward in resources for the identification and recording of this section of Hymenoptera: Aculeata.* Ed.]

Squirrels in Naddle Forest

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Concerns that the Grey Squirrel (*Sciurus carolinensis*) will replace the Red Squirrel (*S. vulgaris*) in Cumbria have resulted in efforts to control the number of Greys. As lethal control is controversial when used in conservation it must be justified and shown to have the desired result. Despite this, little more than the Reds' presence and the number of Greys removed has been reported and no detailed site histories have been produced. In this note we consider the presence of both species in Naddle Forest, Haweswater, during 1999–2016.

Naddle Forest is defined here as roughly 200ha of ancient semi-natural mixed deciduous woodland on the south side of the Haweswater reservoir (NY 41/51). It has units dominated by oak (*Quercus* spp.), birch (*Betula* spp.) and alder (*Alnus glutinosa*), as well as mixed units. The understorey varies between being largely absent or densely dominated by hazel (*Corylus avellana*). It lies at ca. 210–400m a.s.l. and has largely treeless habitat on three sides; the fourth side opens into farmland with scattered woodland.

Background

Common and familiar species are often under-recorded and the only literature reference to squirrels at Haweswater seems to be Mitchell & Delap (1974), who commented that the site holds a 'small stock' of Reds. After records from near Shap (in 1997), Rosgill (in 1998) and Burnbanks (in July 1999) the first Grey Squirrel was found in Naddle Forest in December 1999 (Various, 1973–2016 and pers. obs.). Personal observation and recording here dates to 1980 and more detailed assessment to 2000.

Methods

A head-count of Red Squirrels in woodland of this size is unlikely to be complete and seasonal fluctuations in numbers (due to productivity, mortality and, presumably, food supply) add to the difficulty of determining population size or status. As the impact of Greys could not be assessed without a measure of the numbers of Reds, transect counts were made in most Januaries to provide a comparable baseline guide, and the Reds' general status was continuously assessed during fieldwork.

As the aim of the project was to prevent Greys becoming established, the varying scale of the species' presence could only be assessed using the numbers found. The woods were repeatedly searched for Greys, even when none had been seen, and feeders (latterly with camera-traps) were used to attract and hold them in a location.

The location of the active feeder was changed if it failed to attract Greys in 3–4 weeks. Search and observation sessions averaged about 3.5 hrs and were repeated three or four times per week throughout 2000-2016.

Results

Habitat use

Both squirrel species were recorded in all units, but Reds were most apparent in mixed units with a hazel understorey and Greys were most frequent in oak-dominated units with a scattered understorey. Fewest contacts with both were made in birch-dominated units with little understorey.

Numbers

Feeding stations were an unreliable source of population data as squirrel numbers varied by time of year and for reasons that were not always clear. The largest simultaneous count of Reds was twelve; the typical count per watch session was five, but only one might be seen if the feeder had been out of use for a week or more. Feeder use also declined during the autumn when population size was likely to be greatest. Equally, some Greys appeared not to recognise or need feeders as a source of food.

Red Squirrel: data

The January transects produced an average count of about 50 Reds (range 48–54), suggesting a minimum population density of 0.25 per ha. The Red population was apparently stable, despite three minor outbreaks of the squirrel-pox virus (each killing 3–5 Reds). At no time was any usually occupied woodland unit without Reds and no year showed a major decrease in numbers. Despite this, differing productivity meant that their apparent presence varied considerably; more young were produced in some years than in others and more were produced in the spring of some years and in the summer of others. Observations suggested that productivity was quite low, but this could not be quantified. Numbers would also be expected to vary due to food supply but this could not be measured. Overall, increases above the norm were more easily recognised than decreases in the population.

Grey Squirrel: data

Figure 1 (opposite) suggests there are three basic phases of colonisation: ‘**Arrival**’: the first five years, as the population moved closer to the site; ‘**Establishment**’: the sixth year, in which the site becomes incorporated into the species’ permanent distribution; and ‘**Consolidation**’: the seventh year onwards, when the species back-fills vacant territories.

158 independent Greys (plus sixteen juveniles) were found, with a largest simultaneous count of four full-sized Greys, in Year 6. Most Greys appeared to be

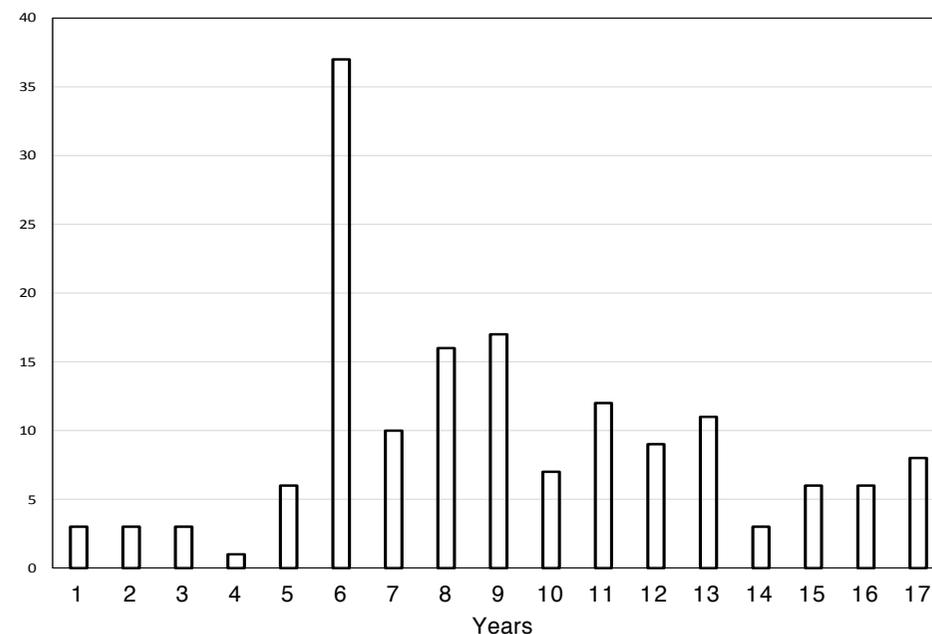


Figure 1. Counts of Grey Squirrels in Naddle Forest in the seventeen 12-month periods (November-December) 1999/00 to 2015/16 inclusive.

found soon after their arrival in a unit and most were controlled on first-sighting. When this did not happen, the next contact may have been with a different Grey in the same location but there was little to suggest the regular presence of multiple Greys outside of Year 6. Most Greys were found singly, but pairs were also found. For example, in Year 11 the same location produced one Grey in March, a drey-building pair in May and a drey-building pair in July, without any additional sightings in the Forest. Females breeding in tree-holes were the most difficult Greys to find and only six breeding attempts are known to have produced young which left the drey.

Figure 2 (page 36) shows the pattern of occurrence to have changed little over time. It also shows that more Greys (86:72) were found with a leafless (December–May) than with a leafy (June–November) canopy. However, the June and September peaks suggests that reduced visibility due to leafiness did not affect the results. Numbers peaking in April–June could be linked to breeding activity making animals more visible and the August trough would result from control limiting the number of young produced here. The December peak in numbers could reflect the onset of breeding activity or post-breeding dispersal, but it largely results from Year 6 providing *c.*29% of the December total; more Greys were also found in the first

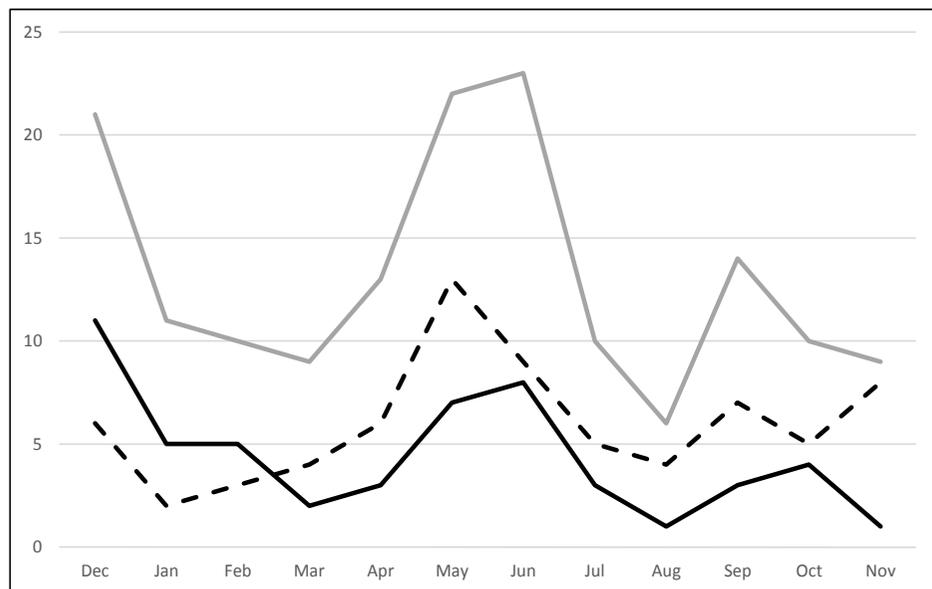


Figure 2. Monthly counts of Grey Squirrels in Naddle Forest in years 1 to 12 (1999/00 – 2010/11). Solid trace = years 1 – 6; dotted trace = years 7 – 12; grey trace = totals both periods.

six Decembers than in the next eleven.

Excluding juveniles found with females, 122 Greys were weighed: four weighed <400 gm, fourteen weighed 400–499 gm, 52 weighed 500–599 gm, 46 weighed 600–699 gm and six weighed >700 gm; the largest, a female, weighed 810 gm. Mean weights; male: *ca.*529 gm; female: *ca.*612 gm; overall: *ca.*562 gm. Corbett and Southern (1977) give a weight range at independence (10–16 weeks of age) of 250–350 gm and Southern (1964) notes that Greys reach *c.*500 gm at about six months of age. Holm (1987) gives an adult weight range of 542–659 gm and Huxley (2003) gives an adult range of 440–800 gm: *ca.*80% of the measured Greys were therefore adult-sized.

More males than females were found (73:49) and, broadly, the smaller the annual total the greater the proportion of males: during Years 1–5 the gender ratio was *ca.*4.5:1, in Year 6 it was *ca.*1.6:1 and in Year 8 it was 1:1. July was the only month in which more females than males were found, probably due to tree-hole breeders becoming more obvious.

Figure 3 (opposite) shows how much variation there was between consecutive years: in the number of Greys found, the months in which they were found and in the

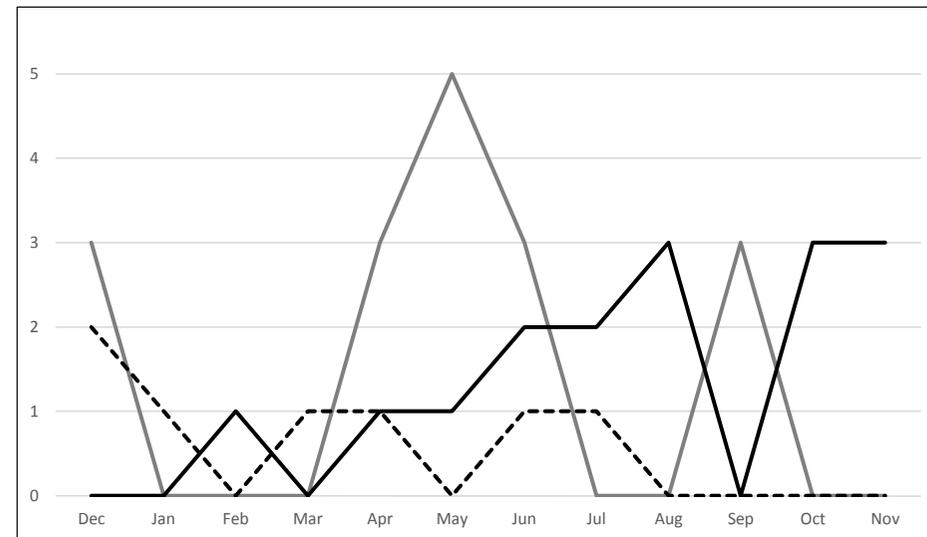


Figure 3. Monthly numbers of Grey Squirrels found in Naddle Forest in three consecutive years: black trace = year 8; grey trace = year 9; dotted trace = year 10.

interval between them being found. The interval between control and replacement in the same location by a Grey of the same gender was shortest in Year 6 (sometimes less than one week) but after this there were often intervals of 2–8 months, with the longest intervals including the period November–February.

Figure 3 also shows that numbers did not always fall when the canopy was in full-leaf, nor rise in the autumn when juveniles should be more apparent, or always show evidence of autumn/winter dispersal.

As with the Red, Grey presence could not be easily linked to the autumn seed crop as most years had unexceptional acorn and hazel crops. Only in Year 6 was there an apparent super-abundance of autumn food (but only three of 37 Greys that year were found after July) and only in Years 7 (one autumn Grey) and 16 (five) was there an obvious failure of the seed crop. The ‘average’ Years 8 and 11 produced the most autumn Greys, nine and eleven respectively.

Discussion

The Grey Squirrel’s arrival in suitable woodland is expected to cause the demise of any Red Squirrel population through weight of numbers and direct competition for food and habitat, but that has not happened in Naddle Forest. Although Red population density here might be towards the lower end of published estimates (Dutton 2004), and despite annual fluctuations, there is no evidence to suggest that either Red numbers

or distribution are now greatly different from before the Grey's arrival.

The total of 158 independent Greys controlled might seem small, given the area and timescale involved, but the effectiveness of the control effort is not measured in the number of Greys removed but in the strength of the remaining Red population. However, it could also be said that if a head-count of Reds is unlikely to be complete the same must be true of Greys, implying that some would be missed.

That said, as control began with the first Grey to be found, and has continued with a searching approach rather than a reliance on reports, feeders or camera traps (none of which can prove the species' absence), a change in the scale of arrival (Year 6) was immediately recognised and countered. There is no evidence to suggest that a large or permanent breeding population was established and went undetected here. Were that the case, as well as more Greys being found, vacant habitat would be reoccupied more quickly and a greater number of smaller Greys would be expected. It is more likely that there is only occasional breeding success here and that most of the controlled Greys originated elsewhere. Also, inside the Greys permanent distribution, the speed of replacement would be limited by productivity, survival, food supply, dispersal distance and control elsewhere in the population.

The pattern of occurrence, Figures 2 and 3, supports this. It is highly unlikely that all the Greys found in June (in a leafy canopy) were present but undetected in leafless March, and more likely that their presence results from breeding season dispersal into the Forest. The gender ratio may also have relevance: if males have larger ranges than females (Holm 1987) they should arrive in a new location first and should continue to be controlled in greater numbers than females.

In these ways, and while Greys will continue to arrive, an effective control effort should restrict them to an arrival phase status producing variable annual and monthly numbers, more males than females and only occasional breeding success and this should support the conservation of Red Squirrels. However, the pattern of occurrence is unpredictable and it is clear that control would have to continue for the Red population to be maintained.

Acknowledgements

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Society News & Announcements

AGM 8th March 2017

Officers for 2017/18 were elected as follows: *President* Stephen Hewitt; *Vice-Presidents* Geoff Horne, David Clarke, Jeremy Roberts; *Secretary* Marie Saag; *Assistant Secretary* Mike Abbs; *Treasurer* Anne Abbs; *Recorder* Frank Mawby; *Editor* David Clarke. Gary Hedges is leaving Carlisle for a new post at Liverpool and is stepping down from Council: his valuable contribution to the Society as *Communications Officer* and as a link to CBDC will be much missed.

Council: Roy Atkins has stepped down owing to his work commitments; Roy's contribution to the Society over many years is much appreciated and will no doubt continue. Other members of Council were re-elected for a further year. They are: Stuart Colgate, Russell Gomm, Sam Griffin, Robin Hodgson, Dorothy Iveson. With the loss of Roy and Gary there were two vacancies on Council. Guy Broome and Simon Jackson were proposed and duly elected to Council.

Treasurer's Report: The Society's finances are stable with annual income just exceeding annual outgoings. Subscription rates will therefore be held at present levels for a further year. The Society's reserves, held for the primary purpose of printing occasional publications, are also healthy and Council is able to commit to the cost of printing a new issue of *Transactions*, see below.

Transactions Volume 13: The Society intends to publish a new volume of the Society's *Transactions* for 2018, to mark our 125th anniversary (Volume 12 appeared in 1996, being the proceedings of our Centenary Conference). The call for papers is already on our website and Facebook pages – with a deadline of the end of May. Articles should be original work pertaining to the natural history of Cumbria. David Clarke will act as general Editor for the issue. Please feel free to contact him for discussion of potential submissions: davidclarke6970@gmail.com

Library: The situation regarding the location and use of the Society's library was discussed. The AGM agreed that Council could make a decision on the future of the Society's library within the next few months and act accordingly thereon.



'Nature Explorers' weekend at Tullie House 11/12 March 2017: *The Society participated in this with a presentation based on a selection of British mammal skulls from the Museum's collections, run by David Clarke and Stuart Colgate. As the event may be repeated in 2018, a screen show of 100 high quality wildlife images of Cumbrian wildlife is being considered as our next contribution: we will seek images from as many members as possible. David Clarke will be pleased to respond to offers.*