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Lakeland Naturalist

— a journal of Cumbrian Natural History



Autumn 2016



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.

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The Mountain Grisette (*Amanita nivalis*). St Sunday Crag, August 2006 © *Stephen Hewitt*

(Wednesdays at 7.15pm., except where stated)

5th October: 'The White-tailed Eagles of Poland'

An illustrated talk by Terry Pickford

19th October: 'Between a rock and a hard place: Conserving the limestone pavements of Britain & Ireland and their flora'

An illustrated talk by Stephen Ward

2nd November: 'Farming with Nature at RSPB Haweswater'

An illustrated talk by Lee Schofield, Site Manager, RSPB Haweswater

16th November: 'Killer Whales – research in Shetland and Iceland'

An illustrated talk by Prof. Volker Deecke, University of Cumbria

30th November: Members' Night

Contributions from the membership

14th December: 'The Wildlife of Mull'

An illustrated talk by Ewan Miles

11th January: 'Incredible Journeys'

An illustrated talk by Brian Morrell, Wildfowl & Wetlands Trust, Caerlaverock
(Joint Meeting with the Cumbria Bird Club)

25th January: 'Graphite in Borrowdale'

An illustrated talk by Dr Dave Millward, British Geological Survey, Edinburgh.
(Joint Meeting with Cumberland Geological Society: **NB starts at 7.30pm**)

8th February: 'The Eden, a natural river for people and wildlife'

An illustrated talk by Paul Greaves, Eden Rivers Trust

22nd February: 'Orchids of Cumbria'

An illustrated talk by Peter Bullard, Director, Cumbria Wildlife Trust

25th February (Saturday): Field Meeting: South Solway Birds

Leader: Frank Mawby (016973 51301)
Meet at Wedholme Flow car park NY238539 at 10am

8th March: AGM & Members' Night

AGM followed by contributions from the membership



1. (p. 33) Richardson's Cackling Goose (with Pink-footed Geese).
Whitriggles, Solway, 12 March 2016. © Nick Franklin



2. (p. 46) Citrine Wagtail. River Esk nr Longtown, 4 September 2016
© Nick Franklin



3. (p. 38)
The hoverfly
*Xanthogramma
citrofasciatum*

Hodbarrow,
13 May 2016

© Nigel Gilligan

4. (p. 46)
Black Oil Beetle
(*Meloe proscarabaeus*)

Silver Tarn, Hollas and
Harnsey Mosses SSSI,
21 April 2016

© Gary Hedges



5. (p. 47)
Lichen Case-bearer Moth (*Dahlica
lichenella*): larval case with protruding
empty skin of pupa

Whinfell Forest. Emerged 23 April 2016

© Gary Hedges





6. (p. 48)

Adonis Ladybird
(*Hippodamia variegata*)

Cummersdale, Carlisle
11 September 2016

© Gary Hedges

7. (p. 48)

Golden Twin-spot Moth
(*Chrysodeixis chalcites*)

Carlisle, 19 July 2016

© Gary Hedges



8. (p. 50)

The fungus
Polyporus tuberaster

Bowness-on-Solway NR,
29 August 2016

© David Clarke



9. (p. 58) **a:** *Boletus edulis*, Eel Crag, Sept 2006; **b:** *Russula laccata*, Grasmoor, Sept 2009; **c:** *Elaphocordyceps* sp., Brandreth, Sept 2005; **d:** *Elaphocordyceps capitata* on host *Elaphomyces* c.f. *granulatus*, High Stile, Sept 2016.

© Stephen Hewitt

10. (p. 50)

The fungus
Multiclavula vernalis

© Martyn Ainsworth



Wildlife Reports, March to August 2016

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

Weather: **March** was drier than average, beginning unsettled but with a good dry spell mid-month, generally cool with some frosty mornings. **April** was the coldest on record, starting unsettled but becoming colder and more settled later in the month with frosty mornings, wintry showers on 27 and 28. **May** was a very dry and settled month, overall the driest spring since 1996. **June** continued dry until 10th then became showery and generally unsettled but quite warm and sunny. **July** turned into a very unsettled month with higher than average rainfall and a violent thunderstorm on 20th, with nearly a third of the month's rainfall overnight on 19–20; the highest temperature of the year at 29 °C was recorded on 19th; overall a warm month, with the average temp of 19.5 °C. **August** had average temperature of 19.7 °C and average rainfall (81 mm), alternating between wet and dry spells.

The cool and generally dry spring provided a good start for breeding birds. From my own observations and records the tits had a very good season. One small concern was the low number of moth records for March and April leaving me wondering if there might be a low caterpillar supply for the birds. I found my first **Long-tailed Tit** nest being built on 17 March and it went through to fledge young around 15 May. Most **Blue** and **Great Tits** had eggs by 5 May and had fledged by the end of May. This year I saw no evidence of nest predation, few nest failures and very few eggs unhatched, with brood sizes about average (Great Tit 6–8; Blue Tit 10–12). Thus fears of few caterpillars seem unfounded.

Birds

The **Whooper Swan** flock at Kirkbride steadily dwindled from 119 on 24 March to 15 on 10 April. JM saw 51 flying high over Jockey Shield late afternoon on 14 March. **Pink-footed Geese** numbers were relatively low in March – usually a peak period. The mild winter produced plenty of grass and many it seems stayed in Lancashire and then carried on north when they did move. However, at least 2600 were still present on 10 April. The most notable goose of the season, a **Richardson's Cackling Goose** was found by NF with 1000 Pinkfeet on Whitrigg Marsh on 11 March (see page 45, and Plate 1). A few **European White-fronted Geese** were with the Pinks and a **Lesser White-fronted Goose** was at Bowness Viaduct on 8 May (RH). **Scaup** were common around Grune Point until recent years, so it was good to see that CH recorded a few on 10 March. A **Smew** usually turns up somewhere in winter and on 8 March NF found a male on Derwentwater. **Grey Partridge** are not a common sight. I usually find them at Watchtree and Thornhill Meadows. I flushed two along the Thornhill track on 8 March and was delighted to flush a covey of 9 from the same location on 30 August; I also recorded them at Whitrigg on 30 May, whilst Workington Oldside (GH) was a

most unlikely site on 5 June and another pair was seen at Woolsty (SGr) on 21 June. After three poor seasons the **Grey Heron** colony near Bowness on Solway made a recovery from 8 nests in 2015 to 11 active nests on 30 April. There was no evidence of **Little Egret** amongst them, but with so many around the Solway surely they will breed soon. An **Osprey** was seen over Kirkandrews-on-Eden on 21 April (DJ) – another expected south Solway breeder. Further records (all JI) were 30 July and 2 August at Anthorn and Campfield on 27 August. A **Hen Harrier** male was near Rogersceugh 7 March (JI) and on 8 May another was hunting over Wedholme Flow (FJM & MP). HK saw a male coming from Walton Moss (Hethersgill side) on 5 May. A **Red Kite** (WO) was seen flying west over Houghton on 4 May, and I had one overhead being mobbed by an **Oystercatcher** on Border Marsh on 5 June – it flew off northwest. A **Goshawk** flashed by LS at Watchtree on the morning of 23 March. **Merlin** is regularly seen on Border and Skinburness Marshes but on 10 March CH had a male and a female. A pure white **Peregrine** provided a remarkable photo for SW at Geltsdale on 2 May.

Oystercatcher and **Curlew** were both back on breeding territory at Watchtree Nature Reserve on 5 March. Both are declining as breeding species in lowland areas, so it was especially pleasing to have three displaying male **Curlews** around the site. An **Avocet** overwintered at Campfield and JI recorded it as late as 28 April. A **Little Ringed Plover** was on Wedholme Flow on 8 May. I have seen several records of **Curlew Sandpiper** for August and DJ reported one on the Campfield Marsh scrape on 28 August. **Ruff** is another species of passage and one was feeding on Wedholme Flow on 8 May but in June I had at least five, of which three were males in full breeding plumage, still displaying. On 28 August DJ had one on the Campfield Marsh scrape. Roding **Woodcock** were seen at Watchtree and Finglandrigg on BTO surveys that I undertake – another species that seems to be in decline as a breeding bird. **Common Snipe** breeding records are scarce, the only records I am aware of being from Thornhill Meadows and the RSPB reserve at North Plain. **Black-tailed Godwit** is a handsome bird in breeding plumage and SG recorded 25 on the Campfield Marsh scrape on 7 April. The **Whimbrel** passage was observed from the 19 April, with six on the Esk (DJ), to 13 May 26 at Allonby (JC). A **Green Sandpiper** was at the Eden/Irthing confluence on 28 March (FJR). A **Wood Sandpiper** on 13 May and **Pectoral Sandpiper** on 18 May were notable observations by NF on the River Esk north of Longtown. **Mediterranean Gull** is regularly seen on the coast and JC had two at Allonby on 8 March, and another was at Anthorn on 16 July (JI). Until a few years ago **Little Tern** bred regularly on the coast, so records of a pair at Grune Point on 26 May (JI) and 18 June (RH) were especially interesting. There was a significant passage of **Black Terns** along the west coast in May but the only record was from DJ who saw 4 on the River Esk near Longtown on 9 May. There is a lot of concern over **Cuckoo** numbers; in our area the principle habitat for them is the raised mires where they target

Meadow Pipits. They were recorded on Wedholme Flow (FJM, MP), Drumburgh Moss (DJ), Bowness Common (JI, FJM), Walton Moss (PH) and Geltsdale (GH). Six records of **Barn Owl** were received in March (C & AR, MP, DC, MR, MP, FJM). From the boxes I monitor, they were late breeding and brood size was low, most with just one or two chicks. The weather was probably the key factor stimulating the daytime hunting and hence the number of sightings. A pair of **Swifts** returned to a regular nest site at the home of RH in Harraby on 1 May, and another was seen over Carlisle (DS) on the same day. RH also recorded the last of the season on 15 August. A **Great Grey Shrike** was at Spadeadam on 31 March (CH). **Sand Martins** (DH) were on the Caldew at Dalston on 23 March and good numbers at Wetheral Viaduct on 25 March (FJR). An early **Swallow** (SG) was seen over the River Eden at Grinsdale on 28 March and was soon followed by others at Tarraby on 31 (WO) and Talkin Tarn 5 April (DJ). **House Martins** were inspecting nest sites on our Kirkbride house on 21 April but we were disappointed to have only four nests this year, well down on the 13 last year. Reports from other observers seem to verify this crash. The only other records are from Brampton (GH), Carlisle (GH), Reghed (DS) and Prospect (DS). **Tree Pipits** were singing on Little Bampton Common on 4 and 8 May (CA, RH) and Cliburn Moss NNR on 4 May (CA). A pair of **Yellow Wagtails** was on the R. Esk at Longtown on 21 April (DJ) and again on 9 May (NF). Return movements were on 16 August at Campfield Marsh Scrape (DJ), a juvenile on Wedholme Flow 21 August (MP), Carr Beds, Rockcliffe 27 August (RH) and Rockcliffe cricket pitch on 28 August (DJ). **Dipper** is probably a commoner species than records suggest but GH confirmed their continued presence along the river through Carlisle on 19 May. A **Redstart** was at Anthorn on 17 April (JI) and another on territory at Talkin Tarn on 20 April (DJ). They seem to be well established as breeding birds in Finglandrigg Wood NNR. A male **Wheatear** was moving along Calvo Marsh on 13 March and a male of the Greenland race was on Wedholme Flow on 8 May. The first **Whinchats** were arriving during a cold spell on 28 April at Geltsdale (SW). **Stonechat** numbers breeding inland tumbled after the cold winter of 2010 but they seem to have steadily increased again with records from Glasson Moss, Bowness Common, Wedholme Flow and Thornhill Meadows. My last record for **Fieldfare** was on 8 March – a flock of 70+ at Saltcotes. **Blackbirds** are one of our early breeders and RH saw one carrying food on 6 April. **Ring Ouzel** records were scarce, the only card being from DJ of 2 on Whinney Fell on 5 April.

Garden Warbler were heard at Powter Howe (MP) on 4 May and Watchtree on 5 May. A male **Blackcap** was singing in Pond Wood at Watchtree on 15 April. **Lesser Whitethroat** seems to be occurring more frequently especially in coastal habitat; records were from Blue Dial, Allonby, on 4 May (JC) and Bowness Viaduct on 8 May (RH). **Whitethroat** seemed quite scarce this season; the first of the season was at Grune Point on 19 April (RH). **Sedge Warbler** numbers also seemed to be down,

which was no surprise after last year's apparently poor breeding season. The first singing male at Watchtree was on 25 April (LS). For **Grasshopper Warbler** the only record received was 6 May at Rogersceugh (JI). However, JC tells me he found a record six nests this season. **Reed Warbler** returned to Watchtree with a singing male present on 20 May. In the southeast of England there is concern about the decline in **Willow Warbler** but in our region the numbers are holding up. Despite the cool start to April my first was at Kirkbride on 5 April and several more were in Finglandrigg Wood on 7 April. A male **Wood Warbler** was heard in Finglandrigg Wood on 8 May (NF) but with no evidence of breeding, however another was on a regular territory in Miltonrigg Wood the following day (DJ) and later two territorial males were heard. They were also heard in Borrowdale on 21 May (GH). **Chiffchaff** as usual was in very good numbers in a wide range of habitats with the first record from Watchtree on 21 March. Most encouraging were six cards for **Spotted Flycatcher**, from Finglandrigg Wood NNR on 7, 8 (RH) and 26 May, Watchtree on 7 May (LS), Cliburn Moss NNR 12 May (CA) and Castle Carrock on 19 July (JM). **Pied Flycatcher** was also seen in Miltonrigg Wood on 20 April (DJ). **Crossbills** are possibly overlooked, with only two records, both from CA, of 14 at Cliburn on 8 March, and five over Finglandrigg on 16 March.

Amphibians and reptiles

Common Frog spawn was seen by RH in his Denton Holme garden on 3 March and Watchtree and Thornhill Moss NNR sites were probably spawned about the same time. Two **Adders** were recorded at Finglandrigg Wood NNR on 15 March (NF) and in April records came from Hangingshaw Moss and Mawbray (KH), and Wedholme Flow. The Dalston Churchyard **Slow-worms** were active from 1 May (DH). The only records for **Common Lizard** were from DJ at Finglandrigg Wood 19 July, one at altitude on Borrowdale Fell (RS) on 3 May, Bolton Fell Moss (SGr) and Silver Tarn (GH).

Mammals

Of 50 **Hedgehog** records, 18 were road casualties. The earliest was on 12 May at Aglionby (GH). The seven **Brown Hare** records are from seven different sites across northern Cumbria, with four records of animals running along the road mostly at night. Watchtree remains a very good site for this mammal. A **Polecat** was seen crossing the road at night near Tebay, 24 June (GH). There were no **Red Squirrel** records and only two **Grey** records, but the Red Squirrel Group records show that the species is still holding on. A **Water Shrew** at Berrier on 12 June in a garden was probably the one found dead a few days later (LSC). Nine of the ten **Badger** records were from GH, the other from DS at a wide range of sites.

Butterflies

Large White is probably much under-recorded, with only two reports. **Small White**, from 6 May, and **Green-veined White**, from 24 April, were regularly recorded. The first **Orange-tip** record was on 5 May in Bitts Park (DS) and last on 21 June at Greystoke (DH). The only **Green Hairstreak** records were from Cliburn Moss: four on 4 May, and more than 40 on 12 May (CA). **Purple Hairstreaks** were flying at Finglandrigg NNR on 19 July (DJ); DC noted them in a new hectad at Acorn Bank on 5 August. **Small Copper** sightings were also low, Geltsdale 4 June (GH), Bowness Gravel Pits 5 June (DJ), Silver Tarn 5 August (RM); up to 3 were in DC's Cumwhitton garden in mid-August. A **Holly Blue** was in RH's Denton Holme Garden on 8 May. **Small Blues** were on the wing at Workington Oldside on 4 June (GH). There was a perception that **Common Blue** numbers were quite low with only 12 records from six sites between 2 June and 9 August, with the Helsington Barrows transect yielding just seven records (MC). Only 14 records for **Small Tortoiseshell** were received, with a flurry of activity between 16 and 20 March (SG, MP, FM). **Peacock** records were scarce, the earliest along a roadside verge, nectaring on Dandelion and Primrose near Lessonhall on 10 April. The majority of records were in August. **Red Admiral** was also scarce with only one record at Kirkbride, on 7 June; four of the six records were in August. It was however a very good **Painted Lady** year, with 4 records from GH on 4 June and 3 from DJ on 5 June. Several records of fresh specimens from 21 August at Brampton (GH) to the end of the month seem to suggest successful breeding. Six **Comma** on a bramble patch on 6 August at Fishgarth Wood (DC) was a notable count. If the Finglandrigg Wood site is any guide, the **Marsh Fritillary** had a very good season helped by good weather during the main flight period mid-May to mid-June. The most interesting record came from HM, who found several broods of caterpillars on the RSPB land to the SE of Rogersceugh. During the flight period I found a single specimen on Thornhill Moss NNR whilst counting **Small Pearl-bordered Fritillary**. This and the Finglandrigg Wood colony of the latter are thriving and benefitting from the Marsh Fritillary grazing management. Its presence was also recorded at Braithwaite Moss, Geltsdale (GH) and Helsington Barrows (MT). The only **Dark Green Fritillary** records were from Helsington Barrows from MT. **Meadow Brown** and **Small Heath** were abundant and often recorded, although **Ringlet** less so, with only eight records from six sites seen by MT, GH and myself. A single record for **Mountain Ringlet** was from Hartsop Dodd 19 July (MT). The raised mire specialist the **Large Heath** was recorded from Scaleby Moss 7 June (GH), Bolton Fell Moss 23 June (SG) and Wedholme Flow 12 July. **Speckled Wood** continues to expand its range and there were 24 records from 8 sites in May, June and August, including a first record for Watchtree Nature Reserve. **Wall Browns** seemed quite scarce in early season, but there were several records and reports in August and some good counts; inland sightings in the Eden valley were especially encouraging (DC). Was **Large**

Skipper as scarce as records suggest? – there were only 6 records, from GH, DJ and myself at five sites. **Small Skipper** was recorded from Watchtree 10 July; JM recorded them from Unity Bog 21 July, Jockey Shield and High Hynam on 5 August; DC even had them in the garden at Cumwhitton on 18 July. **Dingy Skipper** was recorded from Watchtree Nature Reserve (AA, LS and FJM) and Helsington Barrows (MT) from 20 May to 21 June; also at the CNHS Field Meeting to Workington on 5 June.

Other insects

The long cold spring and poor summer have not suited all insects. Early-emerging dragonflies benefitted from the warm spell in May/June, but soon became scarcer. The **Emperor Dragonfly** was widely noted; sightings included two on 8 June at Watchtree although seven were seen earlier in the day by a reliable observer. The **White-faced Darter** flight period in June had good weather and numbers emerging at Foulshaw Moss re-introduction site reached at least 2000. An immature male **Broad-bodied Chaser** was seen at Gamblesby 9 Jun (per LR) and a mature male was briefly at Kirkoswald on 7 July (per JM). NG found a **Black-tailed Skimmer** at Millom Ironworks on 14 July. Other unusual species included the scarce hoverfly *Xanthogramma citrofasciatum* (Plate 3) at south-westerly sites (NG & MR), and the **Adonis Ladybird** at Cummersdale (GH) (Plate 6). Migrant moths included **Humming-bird Hawk-moth** at Carlisle on 2 August (RH) and the **Golden Twin-spot** at Carlisle on 19 July (DI).

Recorders:

RA Roy Armstrong; JC John Callion; MC Martin Chadwick; DC David Clarke; NF Nick Franklin; SG Sara Gomm; SGr Sam Griffin; KH Keith Hamilton; GH Gary Hedges; NG Nigel Gilligan; CH Chris Hind; RH Robin Hodgson; PH Peter Howard; JI John Ireland; DJ David Johnston; HK Harry Kay; FJM Frank Mawby; JM John Miles; HM Hedda Moore; RM Robert Muscat; WO William O'Brian; MR Mo Richards; FJR Jeremy Roberts; C & AR Craig & Ann Robinson; LR Linda Robinson; DS Donna Salter; LSC Lee Schofield; LS Liz Still; SW Stephen Westerberg. Tony Matthews supplied weather notes from Drumburgh.

Frank Mawby

The following reports cover some of the meetings held in the earlier part of the 2016 season; later ones will follow in the next issue.

Borrowdale, 9 April

Leader: Allan Pentecost

A sunny day, snow on the 'tops'. Thirteen of us joined Allan Pentecost, President of the British Lichen Society, to explore the lichens of Great Wood. This has long been known for its richness in these fascinating organisms – sadly somewhat depleted with the loss of elms to Dutch Elm Disease in the 1980s. With quite a high 'learning curve', including a host of unfamiliar scientific names, there was much to discover, and retain! Fortunately, our leader knew just how to engage us in the subject. We looked mainly at lichens on trees, though mossy drystone walls and even pebbles in a watercourse had lichen interest.

Selected highlights from over 60 species we encountered: *Bryoria fuscescens* – a so-called 'beard-moss', rare in Cumbria, but here with some fine colonies on 60-year-old larches; 'pin-lichens' (*Stenocybe septata*) on the trunks of an old holly – almost invisible until viewed in profile; pyrenolichens such as *Leptoraphis epidermidis* – a real challenge and almost invisible with thalli under bark and only the tiny fruit-body openings visible; *Lobaria* spp., and the lichen community that often accompanies them in old-growth woodland, are increasingly scarce, and mainly on oaks now that elm is absent: we visited the famous tree bearing three *Lobaria* species, noting especially the curious 'cephalodia' (containing only blue-green algae) with *L. amplissima*; other species of the 'Lobarion community' were *Catinaria atropurpurea*, the tiny shell-like blue-green *Normandina pulchella* and bristly silver-grey thalli of *Parmotrema crinitum* on a few oaks, and even on the roadside wall.

By the end of the visit we had learned many fascinating facts about lichen natural history, and seen a very varied selection of species, all within the 1 km square NY2721. The full list can be found on the Society's website.

David Clarke

Oldside Wind Farm, Workington, 5 June Leaders: Sam Griffin & Lucy Merry

On a sunny Sunday morning fifteen members of the Society met for a walk around this seaside location. Sam introduced us to the site and we headed off along the track from the car park. Despite the site being popular with trail bikers – with the occasional blast of sand as they roared past – we were on the whole not bothered by the other users of the area. We were here to see especially the Small Blue, Britain's smallest butterfly, and it did not disappoint as we had many sightings on this ideal day. Steve Doyle accompanied us and was able to tell us all about the work that Butterfly Conservation has done to improve the habitat for this butterfly. The Small Blue lays its eggs on the Kidney Vetch (*Anthyllis vulneraria*), and the sides of the ditches on the site provide the home for this plant and shelter for the growing caterpillars. Unfortunately, when

the wind farm was constructed about 25 years ago, some of these ditches were innocently filled with excess soil and a drop in the population of Small Blues resulted. Butterfly Conservation have done impressive work over the years constructing about 30 scrapes on the site which are now of differing ages. The scraped areas provide the ideal spot for Kidney Vetch which is now growing well in numerous places. Careful inspection of some Kidney Vetch plants revealed eggs of the butterfly – one egg per floret and with a seeming preference for the tallest of stems.

Other butterflies we saw included Speckled Wood, Small Heath and Painted Lady, along with Dingy Skipper and Common Blue, which both lay their eggs on the plentiful Common Bird's-foot-trefoil (*Lotus corniculatus*). The low vegetation was brightly coloured with Meadow Vetchling (*Lathyrus pratensis*), Burnet Rose (*Rosa spinosissima*), Broom (*Cytisus scoparius*), Bloody Crane's-bill (*Geranium sanguineum*) and Scarlet Pimpernel (*Anagallis arvensis*). Near here we were shown a group of about 15 Bee Orchids (*Ophrys apifera*) which were yet to come into flower. Sea-buckthorn (*Hippophae rhamnoides*) is creating some problems on the site and has been partially cleared. Steve Doyle told us that there was a 6-year rotation of strimming along sections of the banks giving a variety of vegetation heights.

As we reached the edge of the beach we came across Wild Carrot (*Daucus carota*), Isle-of-Man Cabbage (*Coicya monensis* ssp. *monensis*), Sea-kale (*Crambe maritima*), Sea Plantain (*Plantago maritima*), and Sea Holly (*Eyngium maritimum*). We ate lunch overlooking the sea then walked to a grassy bank where we found Thrift (*Armeria maritima*), Cat's-ear (*Hypochaeris radicata*), Tufted Vetch (*Vicia cracca*) and growing where the sward was short were numerous small examples of Moonwort (*Botrychium lunaria*).

Walking back along the beach, the tide was on the turn and starting to go out. Gradually this exposed some of the seaweed which Lucy Merry identified for us and included Spiral Wrack (*Fucus spiralis*), Bladderwrack (*Fucus vesiculosus*), Egg Wrack (*Ascophyllum nodosum*), Sea Oak (*Halidrys siliquosa*) and Channelled Wrack (*Pelvetia canaliculata*). Living amongst the seaweeds were Flat Periwinkle (*Littorina obtusata*), Shore Crab (*Carcinus maenas*), shore springtails (*Anurida maritima*) and Dog Whelk (*Nucella lapillus*).

As we walked back across the beach to the car park we saw Ringed Plover and Oystercatchers – all that was missing was an ice cream van on this extra hot day. It had proved a surprise to many of us that a location so close to Workington could prove such a Mecca for wildlife.

Marie Saag

Thornhill Meadows, 18 June

Leader: Frank Mawby

Seven members attended the meeting, which started from the layby on the B5302 near Beck Farm, Wheyrigg. There is a small area of grassland between the road and the layby, which is semi-natural vegetation, probably showing a plant community that would have been common on lots of meadows before improvement. The roadside verges are similarly interesting and quite diverse: Crow Garlic (*Allium vineale*) was pointed out by Jeremy Roberts.

The morning weather was overcast and cooler than of late and this suppressed butterfly movement, with very few seen other than the occasional Green-veined White. We spent much time in Thornhill Meadows and explained how Jeremy, Margaret and I came to own them as Thornhill Meadows Trust (Margaret has since retired and John Callion and Russell Gomm are now Trustees). One of the three fields is part of Thornhill Moss and Meadows SSSI. At the time of notification in 1983, the two non-SSSI fields were semi-improved hay meadows and cut most years for hay. The fields are on about a metre of peat and the drainage system was badly damaged. Since TMT acquired them the two fields have reverted to poor fen and we think they would now meet the SSSI criteria. The first, most easterly field, reverted to very dense Soft Rush (*Juncus effusus*) but over the last five years has changed noticeably into a diverse poor fen community. Sedge Warbler, Reed Bunting and Meadow Pipit were present and many were carrying food. FM ringed a brood of four Meadow Pipits in a nest he had found by chance ten days earlier. A wide drain forms the boundary with the next field and this drain was widened out some years ago to create a water feature. The water levels are managed as part of the Environmental Stewardship prescriptions for breeding wader. FM also explained that we graze the fields with Highland Cattle, brought in by a grazier who specialises in contract conservation grazing. The middle field undulates more than the two either side, the lower areas being dominated by Soft Rush and here we heard Grasshopper Warbler singing. A mosaic of rush interspersed with more diverse patches of grassy vegetation has developed on the higher area. Here Yellow-rattle (*Rhinanthus minor*), sedges and Common Spotted-orchid (*Dactylorhiza fuchsii*) are found along with the Devil's-bit Scabious (*Succisa pratensis*) that we have planted to try and create suitable habitat for the Marsh Fritillary butterfly. Getting the grazing right is a key challenge here.

Our SSSI field is one of three fields designated, the other two being owned by a neighbour. There is a clear difference in the plant communities, as in addition to Common Spotted-orchid there is Northern Marsh-orchid (*D. purplella*) and (at least previously) Lesser Butterfly-orchid (*Platanthera bifolia*). This field is difficult to manage due to the soft peaty ground and only once in fifteen years have we been able to cut and clear it. Most years we cut all or part of it to create a short sward for breeding Lapwing and Snipe but we have to leave the cuttings lying. Most winters the area floods and the cuttings are floated onto the slightly higher areas, which is not ideal.

The floods last winter had left a large swathe of dead material around the gateway in the NE corner. Lapwings have not bred on the site for some years, but a pair of Snipe is present every year. Curlew will try occasionally. A large area of the eastern half of the field was dominated by Meadowsweet (*Filipendula ulmaria*), with patches of shorter vegetation showing greater diversity. The western third was generally shorter and more diverse with a pink glow from abundant Ragged Robin (*Silene flos-cuculi*). After a brief search we located the patch of Bladder Sedge (*Carex vesicaria*) which has few sites on the Solway Plain. A full plant list covering of the species found on Thornhill Meadows this day will be available on the website.

We took lunch on the track at the entrance gate and located the pair of Stonechats with a family of at least four recently-fledged young, which had nested in the middle field. Other birds noted were Willow Warbler, Whitethroat, Garden Warbler and Skylark.

We made our way along the track to Thornhill Moss National Nature Reserve and Frank informed the group that at least two other neighbours had rushy fields nearby in the appropriate environmental Stewardship schemes. Thornhill Moss is an interesting peatland site with a fen-type peat up to 8 metres deep (determined by a stratigraphical study carried out by Ros Tratt several years ago at Sheffield University). The whole Holme Dub area is a mix of estuarine sediments and peat deposits formed after sea levels dropped. The whole area is drained to make much of it suitable for agriculture by the Holme Dub and Crummock Beck drains, which are at least 4 metres deep in places. Despite the drainage further west there remains a number semi-improved fields where Curlews and Lapwings still breed. The area is well used by Pink-footed Geese and Whooper Swans in the autumn and winter.

Thornhill Moss management has been quite challenging over the years and at one time Hebridean sheep were used to try and manage the vegetation. However, in recent years Natural England have used Highland Cattle to take off the vegetation. They have also removed some of the trees and scrub. Without management the site would go to woodland and scrub and the plant community would change. As with many nature reserves the site is small and unfortunately the concept of re-wilding is not appropriate if the current plants, animals and invertebrates are to survive. Re-wilding probably only works on large areas where a typical suite of birds, mammals and invertebrates can develop to sustain a diversity of habitats. The Holme Dub would be a splendid area for re-wilding but ownership and conflicting land use are significant obstacles to achieving it.

The key feature of Thornhill Moss is the plant communities, and six species of orchid, Heath (*D. maculata*) and Common Spotted-orchids, Early (*D. incarnata*) and Northern Marsh-orchids, Lesser Butterfly-orchid, and occasional Common Twayblade (*Neottia ovata*), can be found here. Devil's-bit Scabious and Bogbean (*Menyanthes trifoliata*) are locally abundant and there are fine tussocks of the Greater

Tussock-sedge (*Carex paniculata*). Round-leaved Sundew (*Drosera rotundifolia*) was seen on sphagnum hummocks and small patches of Bog Asphodel (*Narthecium ossifragum*) were just coming into flower. The sun came through in brief flashes and butterfly activity increased, with 22 Small Pearl-bordered Fritillaries, abundant Ringlets, Meadow Browns, Green-veined Whites, and a few Large Skippers being seen. Frank had seen a single Marsh Fritillary here ten days earlier but none was seen on the visit. He explained that as part of the Cumbria Marsh Fritillary Action Group reintroduction programme they had been introduced to a nearby site. The last reports of the species in this area go back into the early 1970s. In the wetter areas Four-Spot Chaser dragonflies and Azure Damselflies were seen, but the big surprise was a female Banded Demoiselle, presumably a wanderer from the nearby River Waver. Walking back down the track three Painted Lady butterflies were seen and a family of Whitethroats. Overall a day to suit any all-round naturalist.

Frank Mawby

Bolton Fell Moss, 2 July 2016

Leader: Tania Crockett

Following Alasdair Brock's talk about the lowland raised bogs in Cumbria last winter, this was a follow-up visit to Bolton Fell Moss, the latest addition to the list of raised bog restoration projects in Cumbria. Tania Crockett from Natural England led eight Society members, giving us an enthusiastic introduction to the site, and much interesting information *en route*. Unfortunately, the day was windy and quite wet at times, which reduced the chances of seeing insects on the wing.

Bolton Fell Moss had been commercially used for peat extraction and milling from the mid 1950s until just over two years ago. Peat removal had been licenced until 2042, but as on an international level the UK needed to restore more peatlands, the licence was bought under compulsory purchase by English Nature. The whole of Bolton Fell Moss and nearby Walton Moss have now been notified as a new SSSI (collectively over 1000 ha). Some parts of Bolton Fell are still covered by bare un-vegetated peat, while other areas are partially restored, and yet other parts of the area ('Reserve' and 'Armstrong') have original peat bog vegetation – these were the earlier-designated SSSIs. At the peak of peat extraction, the site was serviced by seven miles of railway track, now removed. Their former routes are used as access pathways.

The first area we passed was called 'Slacks' which the peat milling company had attempted to restore as part of their original licence to mill. This has succeeded to a certain extent, but a problem with water-table management had led to the formation of a large lake. Although this had been unintended, our group thought that the lake made a valuable addition to the site, increasing its biodiversity, and an attraction for birds in particular. It would gradually infill naturally over time. The alien moss *Campylopus introflexus* covered large areas of the bare peat. A Roe Deer was seen running further along the track. Steve Routledge netted two species of water-beetle

and a female newt from a ditch.

Next we passed an area where some bunding work had been carried out. A network of peat bunds had been made in order to retain water in 'cells'. The area has also been spread with a refined mixture of sphagnum, cotton-grass and heather in the hope of speeding up vegetation growth. Only locally-sourced material has been used. Natural England are monitoring the changes on site to assess which of the various methods of restoration are proving the most successful.

Soon we were walking along the edge of a wooded area. Guy Broome had been on site the day before and left a light trap working in this area to attract moths. He was able to show us a Buff-tip moth, a Large Emerald and a Scalloped Hook-tip moth. In this area we also saw a Four-spot Chaser dragonfly and a soldier beetle.

Taking a rail-track to the south for a short distance we saw a large number of plants of Small Cudweed (*Filago minima*) on ballast – a site that had been discovered the previous week by Phill Brown. Early Hair-grass (*Aira praecox*) was growing alongside the Cudweed.

Deep wheel ruts in the 'Copse' area were evidently permanently wet: David Clarke found both half-grown and fully mature larvae of the Southern Hawker dragonfly here. As with the other sites common water beetle species were present along with adult frogs and tadpoles. An Azure Damselfly adult was also seen.

After a break for lunch we walked on to the original SSSI area of the site. The area known as 'Reserve' had been drained by ditches, but blocking will raise the water table. This area has never been used for peat extraction and is a good bog habitat, with hummocks of *Sphagnum*, along with White Beak Sedge (*Rhynchospora alba*), Bog Asphodel (*Narthecium ossifragum*), Bog-rosemary (*Andromeda polifolia*), Cranberry (*Vaccinium oxycoccus*), Crowberry (*Empetrum nigrum*), Round-leaved Sundew (*Drosera rotundifolia*), Ling (*Calluna vulgaris*) and Cross-leaved Heath (*Erica tetralix*). Jeremy Roberts was looking at the deergrasses in this area and determined that both the Hybrid (*Trichophorum* × *foersteri*) and the rarer Northern Deergrass (*Trichophorum cespitosum*) were present. (The latter was also located at nearby Walton Moss by Jeremy later the same day.) Moving onto another part of the SSSI known as 'Armstrong', Tania told us that this area continued to be owned by the Armstrong family, who received stewardship payments for the SSSI. Here we found a Fox Moth caterpillar. Carrying on and back towards the cars, Steve and David stopped to sample another pond – here finding the nymphs of Black Darter, Common Hawker and Four-spot Chaser dragonflies, along with a couple of Emerald Damselfly nymphs and the larva of the Black-bellied Diving Beetle (*Dytiscus semisulcatus*).

Before returning to the cars there was the opportunity to watch Little Ringed Plover – they have been nesting here despite the activity from the nearby buildings.

Marie Saag

Richardson's Cackling Goose at Anthorn

One of my regular routines in winter is to drive round 'The Island', as the locals call the peninsula between Anthorn and Bowness-on-Solway, checking the geese flocks for anything out of the ordinary.

There is always hope of a Snow or Red-breasted Goose with the Barnacles, or a Bean or Whitefronted Goose among the Pinkfeet, and I was aware, as I set out, that there had been a movement of geese up from Lancashire to Cumbria on 11 March 2016, so I was hoping for something different.

On that day, the first flock I stopped at was a large gathering of Pinkfeet at Whitriggles (NY236578), and on virtually the first scan I picked out a small 'Canada Goose'. It looked interesting because it was very small, but it would not show itself properly, remaining in the densest part of the flock and at a distance. I had only managed a few quick photos when a farmer drove his vehicle towards the flock, presumably with the intention of flushing it off his grazing. This worked as intended and around 3,000 Pinkfeet took flight towards the estuary.

I took to the car and followed, and was relieved when they pitched down in the fields regularly occupied by the geese beside the old cottage at Whitrigg (NY220575). 'Scope duly set up again, I began searching through them, with the added complication of a thousand Barnacles now mixed in as well. This time it took a good twenty minutes to find it, but I was eventually helped by the fact that it suddenly flew on its own towards me and landed as one of the closest geese (Plate 1).

This meant I was able to take my time noting its relevant features. The small body size and small head with short, stubby bill identified it as a Cackling Goose, an American vagrant. The distinct pale upper breast area showed it to be a Richardson's Cackling Goose (*Branta h. hutchinsii*), rather than one of the other subspecies, Taverner's Cackling Goose (*Branta h. taverneri*) or Ridgway's Cackling Goose (*Branta h. minima*). I had time to take plenty of photos which proved useful in confirming the identification, the record being duly accepted by the British Birds Rarities Committee. (The taxonomy of 'Canada geese' is complex: the naturalised species commonly occurring in the UK is *Branta c. canadensis* – the Canada Goose.)

It was interesting to note, while researching this bird, I found that Cackling Goose had only been officially added to the British list by the British Ornithologists' Union Records Committee in the previous week. The Solway bird was the first to be identified in the UK after this, and therefore attracted considerable attention from birders outside Cumbria. It remained until the following day, enabling many people to travel to see it. It is the second record for Cumbria, following one found in virtually the same field in autumn of 2012.

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Citrine Wagtail on the Esk at Longtown

A walk along the river on 3 September 2016 from the A7 layby was initially uneventful, with only some Black-headed and Common Gulls in various stages of moult providing any interest. As the forecast heavy rain was already darkening the skies I headed back but stopped to check a small group of wagtails on a shingle island. Almost immediately I noticed a bird with a very interesting head pattern – grey ear-coverts, encircled behind by a distinct pale border. That ‘look’ just shouted out: Citrine Wagtail, *Motacilla citreola!* But could it really be? The breast was whitish and unmarked, which was a good feature.

The only identification resource I had with me was the Collins Bird Guide application on my ‘phone. All the features the bird showed seemed to fit – the all-black bill, the two broad white wing-bars, the white under-tail coverts and the dark lower border to the grey crown. But the lores were worrying: were they pale enough? They seemed rather smudgy. I took a rapid series of ‘phone-scope’ images while hoping that the nearby wading fisherman did not flush the bird.

Back home and checking more literature I found an article by Andy Stoddart saved from an earlier *Birdwatch* magazine. ‘Lores smudgy’ he commented, and the accompanying image confirmed this. Other sources gave further support to this appearance being right for Citrine Wagtail. So before mid-day I put the news out on *BirdGuides* and *BirdingCumbria*. The record shot I uploaded to *BirdGuides* produced a favourable response and the message was upgraded from ‘probable’ to definite.

The bird was seen and photographed by a good number of people over the next two days (Plate 2) and was, I think, the first ‘twitchable’ Citrine Wagtail for Cumbria. Interestingly, the only other Cumbrian record that I am aware of was recorded by Colin Raven on Walney Island last year on a date just twelve days earlier. He described a very similar weather pattern with thick cloud over the Irish Sea. That bird departed before any other observer was able to see it.

The species breeds in the central Palearctic and winters in India and southeast Asia. The first to be found in England was in Suffolk in 1964 with another fifty coming over the next four decades or so; most records have come from eastern coastal counties and the far southwest.

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A new colony of the Black Oil Beetle (*Meloe proscarabaeus*) discovered in West Cumbria

On 21st April 2016, during a Cumbria Biodiversity Data Centre site visit, Deborah Muscat (CBDC Manager) and I discovered what appears to be a previously unknown and thriving colony of the Black Oil Beetle on coastal grassland at Silver Tarn, Hollas

and Harnsey Mosses SSSI (NX9906), south of Nethertown. Without rigorous searching, seven adult beetles were found over approx. 10 square metres (5 females and 2 males) on a sunny south-west facing bank of the Silver Tarn section of the SSSI. This is the highest-ever count of *M. proscarabaeus* in the county. These individuals included one 30 mm female digging her nest into bare ground between short turf with abundant buttercup (*Ranunculus*) species. Solitary bee nests were frequent in close proximity to the adult beetles and more widely around the banks of the SSSI kettle-hole formations. These nests are essential for the beetles, hosting their larvae which feed on the bees’ pollen stores and on their immature offspring. I visited the site again on the evening of 31st May 2016, finding two more adults (one male and one female) in a then much longer sward (Plate 4). In Cumbria, *M. proscarabaeus* is mainly restricted to the western coastal areas and these observations are the only two in the past five years.

Sightings of *M. proscarabaeus* in upland areas of the county are occasionally submitted by walkers, curious of the large and ‘unusual’ looking beetles. These records are usually unverifiable but likely to be the very similar Violet Oil Beetle (*Meloe violaceus*), which is more widespread in Cumbria and reliably recorded on some fell-sides. For record acceptance of either species, a good quality close-up image of the base of the pronotum should be obtained or a specimen collected. Adults can be sustained on *Ranunculus* leaves and returned to a site following a positive identification. Due to drastic declines nationally, both *M. proscarabaeus* and *M. violaceus* are listed as priority species in the UK Biodiversity Action Plan.

Databases searched: *Cumbria Biodiversity Data Centre (2016)*; *National Biodiversity Network Gateway (2016)*.

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The Lichen Case-bearer Moth (*Dahlica lichenella*) new to Cumbria

On 23rd April 2016, a wingless adult female Lichen Case-bearer moth (*Dahlica lichenella*) emerged from a 6 mm sealed larval case I had peeled off a wooden lamp post at Center Parcs resort, Whinfell Forest nine days earlier. The case, covered with granules of algae and lichens, had drawn my attention due to the scarcity of adult moths on the wing during a regular nocturnal moth survey! This is the first record of the species in Cumbria and one of very few in northern England, having only been recorded for the first time in Yorkshire in 2015 (pers. comm. C. Fletcher, 2016). In a 2012 review of the status of micro-lepidoptera in Britain, *D. lichenella* was classified as Nationally Scarce A. However, the cryptic nature of the species, identification difficulties, and current known UK geographical range (Perthshire to Hampshire) suggest it has probably been overlooked. In this case, positive identification was made

from an examination of the head plate of the pupal exuvia (seen protruding from the case in Plate 5); the pre-pupation stages are not identifiable. Males have yet to be found in the UK, and the parthenogenetic adult female form is only occasionally encountered, so its attempted detection at other Cumbrian sites should focus on looking for vacated cases in March–April on lichen-covered surfaces in sunny situations. Ideally, the exuvial head plate should be collected but the case itself left *in situ* as it may contain dozens of eggs laid by the emerged female. Due to the species' obscurity, evidence for this record was referred to, and accepted by, the regional National Moth Recording Scheme micro-moth verification panel. The specimen will be donated to Tullie House Museum.

Useful website links:

UK Moths: <http://www.ukmoths.org.uk/species/dahlica-lichenella>

Lepiforum.de: http://www.lepiforum.de/lepiwiki.pl?Dahlica_Lichenella

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An inland record of the Adonis Ladybird (*Hippodamia variegata*)

I had four of these on Caldew River shingle at Cummersdale, Carlisle on 11 September 2016 and they almost had me fooled for 11-spot Ladybird (*Coccinella 11-punctata*). The size, elytral colour and arrangement of black elytral spots are similar but the pronotum of Adonis Ladybird is distinctively almost entirely black without the false eyespots that are always present on 11-spot Ladybird. This appears to be the first record of the species since 1989 in Cumbria and only the second non-coastal record (Plate 6). Alas, I didn't find what I was looking for, the rare and elusive 5-spot ladybird.

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Golden Twin-spot moth (*Chrysodeixis chalcites*) new to Cumbria

On 19th July 2016 during a mothing session in my Carlisle garden at dusk (10–11 pm) I netted a noctuid unfamiliar to me. On checking my 'Skinner' [*Guide to the Moths of the British Isles* (1997)] I came to the conclusion it was a Golden Twin-spot (*Chrysodeixis chalcites*), a migrant species that rarely reaches northern Britain (Plate 7). The following day, I brought the moth into Tullie House Museum where Gary Hedges checked my identification and the county records which show it is a first for Cumbria. The main issue was distinguishing this from the similar but much rarer migrant the Tunbridge Wells Gem (*C. acuta*). The moth is most likely to have originated in southern Europe where it is resident. There are usually several records

of adult moths from the southwest and east coasts of England each year but there is currently no evidence of the species breeding in the UK (HantsMoths 2016*). The County Moth Recorder Liz Still has verified the record and the specimen is now stored in Tullie House Museum.

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*Website: HantsMoths - <http://www.hantsmoths.org.uk/species/2428.php> (accessed July 2016)

White-letter Hairstreak (*Satyrrium w-album*) at Wetheral Woods, 2016

A record of a single White-letter Hairstreak by the River Eden at Wetheral Woods on 14th July 2016 was received by Cumbria Biodiversity Data Centre from the finder Ian Lambert. The Recording Officer at CBDC, Gary Hedges, mentioned the record to me (as a local resident) on 21st July.

Since this was a species I had never knowingly seen, I was astonished to learn that it could be found 'on my doorstep', and indeed where I walk many times a year. How long had the species been present here?

It was not until 1st August that Margaret and I visited the site, in mid-afternoon. The gate south of the pump-station at the up-river end of the woods was leaned upon, and the elms on each side of the access track were scanned. After a shortish wait, at least two small dark butterflies were seen chasing and spiralling together several times around the top of a particular small elm on the river (east) side of the track during sunny breaks, in that erratic, almost impossible-to-follow, way that hairstreaks have. Individuals repeatedly 'chivvied' bees and hoverflies also flying over the top of the tree. On a single occasion one was seen to fly across the path to much taller elm trees on the opposite (west) side of the track. I got one poor record photo of a very tattered individual.

I returned on the next day (2nd August), without much hope, the weather being now cloudy and breezy, if quite warm and humid at midday. However, in a long spell of watching, a single individual was observed for periods, feeding (presumably on aphid honeydew) in the same tree. Making only brief flights between feeding sites, it rarely drew attention to itself. However, by panning back and forth with the binoculars across the treetop from some small distance away I was able to spot the butterfly several times as it crawled about on the twigs and top sides of leaves in the upper third of the tree, but often largely obscured. Eventually some rather better photos were obtained of this fresher individual.

The map in the 2001 *Atlas** has a conspicuous 'gap' covering all of Cumbria, and indeed most of northwest England. Yet – despite the fears expressed a few decades earlier as dutch elm disease ravaged elms, the only larval food-plant of the species – since 2007 the insect has advanced as far as south Cumbria, with a number of records

now from Arnside Knott, Sedgwick, Sizergh, Stainton, and elsewhere. In 2011 there were sightings from Culgaith, east of Penrith. The only other record north of these localities known thus far to CBDC is that of the single photographed by Reva Archer at Low Gelt Quarry, Brampton (about 8.5 km northeast of Wetheral Woods), at the late date of 25th August 2015. However, the species' presence in the Wetheral area might suggest its possible occurrence almost anywhere across the Eden valley. Although tall and mature elms were described in the *Atlas* as favourite sites for this butterfly, pre-dutch elm disease, it seems that the vigorous re-growths of Wych Elm (*Ulmus glabra*) are now strongly favoured – and this is the form occurring most widely in Cumbria.

To observe, I suggest standing next to elms in sheltered sunny places anywhere in the valley, and craning up to see 'small black flitty things'. Then it's binoculars, and patience!

With thanks to Gary Hedges of CBDC for extracting the records mentioned here.

*Asher, J., Warren, M, Fox, R., Harding, P., Jeffcoate, G. & S. (2001) *The Millennium Atlas of Butterflies in Briatrain and Ireland*. Oxford: OUP.

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The fungus *Polyporus tuberaster* at Bowness-on-Solway Gravel Pits Reserve

A single example of this distinctive small polypore fungus with a scaly cap surface was growing on a dead stem of Gorse (*Ulex europaeus*) within the woodland at this site on 29 August 2016 (Plate 8). It more often grows on fallen wood of deciduous trees. In the north of the UK it is very sparsely recorded. Including this one, there have only been half a dozen records from Cumbria since the 1880s – from two localities in the south, one from Great Wood, Keswick and one from Kingmoor, Carlisle, all since 1995. This adds a new hectad (NY26) for this species for the county.

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The fungus *Multiclavula vernalis*, not lost, or found, in Cumbria?

A project named the 'Lost and Found Fungi Project'* focuses on fungi that have been rarely recorded from the British Isles and carries out targeted surveys to establish whether they still occur, and if so whether they are genuinely rare or merely under-reported. Amongst the hundred species sought is a fascinating and unusual lichenised

orange basidiomycete 'club' *Multiclavula vernalis* (Plate 10). The algal cells associated with the fungus form a dark green granular mat, much in the manner of the relatively widespread and related *Lichenomphalia* (*Omphalina*) species. *Multiclavula* has been recorded from the extremities of Britain (i.e. Hampshire and Shetland) but almost nowhere else, and certainly never from Cumbria. Its habitat preferences, wet, bare peat, quite often with sundews, seem to qualify it well for occurring in our area – especially on the huge coastal peatlands. It ranges 7–20mm high and usually occurs in groups during the summer months. (On first glance it might be confused with the superficially similar, non-lichenised, 'Bog Beacon' *Mitrula paludosa* (an ascomycete), which can occur on wet rotting material in similar habitats but that is larger and has a distinct pale stipe and a more definite 'cap'.

Any suspected examples of *Multiclavula vernalis* should be reported as soon as possible after finding and will need to be verified. Please contact Paul Nichol [pnichol20@gmail.com] in the first instance.

*The project runs for five years from 1 July 2014 and is managed by the Royal Botanic Gardens, Kew, funded by a generous donation from the Esmée Fairbairn Foundation. Visit the project website: <http://fungi.myspecies.info/content/lost-found-wet-heath-wetlands-section> for more details of *Multiclavula*. (The Project also promotes the conservation of 'found' species in partnership with local specialists and stakeholder groups.)

Editor

Duck Decoys in the Lake Counties

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Duck decoys were introduced into Britain from The Netherlands in the 17th century as a means of catching ducks to provide fresh meat for the table in the winter months. They were permanent structures comprising typically a central pond from which radiated a number of arms, or 'pipes' as the decoymen called them, covered with netting. The birds were lured into these pipes using a dog, for which ducks have an innate fascination, or simply enticed in with a combination of food, usually grain, and tame (pinioned) ducks. A second, much less common, type of decoy comprised simply a cage or trap with a small funnel-shaped entrance, into which the birds were enticed with grain and/or tame ducks. The word decoy is said to be a contraction of the Dutch *eendekooi*, a compound of *eenden*, ducks and *kooi*, cage, and it is via this route that 'to decoy' came to take on its modern meaning of 'to lure' or 'to deceive'. The heyday of the duck decoy was from the early 18th century to the middle of the 19th century, but their popularity went into fairly rapid decline thereafter, partly, it is suggested, as the number of wintering wildfowl fell due to drainage of wetland areas (Heaton 2001), but also perhaps due to developments in gun technology, specifically the introduction of the breech-loading rifle.

Realising that duck decoys were fast disappearing, Sir Ralph Payne-Gallwey, himself the owner of a decoy on his estate near Thirsk in Yorkshire, set about collecting information about them and this resulted in his book of 1886 entitled *The Book of Duck Decoys, Their Construction, Management and History*. In it he makes reference to some 215 decoys, just 44 of which were still operating at the time he was writing. He mentions only one in the Lake Counties, and that was at Lowther in what was then Westmorland. Payne-Gallwey's list is known to be incomplete (Shrubbs 2013) and two others in what was Cumberland have since come to light. These three, together with a fourth at an unknown location, probably Broadfield, which never got beyond the planning stage, form the basis of the following notes.

Lowther

Payne-Gallwey (1886) notes that '*in the park at Lowther is an oval-shaped pool of about 3 acres, known as the 'Decoy'. No pipes are now discernible, nor do any records exist of this Decoy, other than that it was once used for catching ducks.*'

The 1:25,000 Ordnance Survey map shows three features about a kilometre southeast of Lowther Castle and all in 1 km square NY5322 which refer to a decoy: *Decoy Pond*, a large, roughly oval pool surrounded on three sides by trees, which is

presumably that referred to by Payne-Gallwey, *Decoy Hag Pond*, a much smaller pond surrounded by trees, and *Decoy Hag*, a wood. *Hag* in these names derives from Modern English dialect *hagg*, a copse or plantation (Smith 1967). *Decoy Pond* is located at the top of a hill and was formerly two separate ponds used to breed fish but, on the recommendation of the landscape gardener Richardson, they were combined sometime after 1754 to create the decoy (I. Jack, pers. comm.). There is a passing reference to this decoy in Macpherson's *Vertebrate Fauna of Lakeland* (1892) and he expresses the view that it was probably in use until the end of the eighteenth century. If this was the case, it is likely that it was in use for no more than a few decades and by implication was not a great success.

Muncaster

About a kilometre southwest of Muncaster Castle is a feature shown on the 1:25,000 Ordnance Survey map as *Decoy Pond*, a small, rectangular pool of roughly a third of an acre. The 1:2,500 map of the area shows the surrounding wood to be named *Decoy Wood*. A visit to the site in November 2012 found it very overgrown. No evidence could be found for any pipes, nor are any apparent in satellite images of the site available at Google Earth. Macpherson (1892) supplies the following additional information about this decoy:

'The original decoy pond at Muncaster is now grown over with vegetation. Tall trees, not less than a century old, have rooted in the basin of the former lakelet. A casual inspection suffices to show that once upon a time the accumulated waters of this decoy burst the dam which pent them in, and pouring away to the low grounds, left the decoy a natural hollow watered by a little stream. Judging that this disaster was fatal to the success of the decoy, the lord of Muncaster constructed a small sheet of water, and there his new 'pipe' was laid. This held water, but it must have been too small for practical purposes, and local tradition affirms that it was recognised to be a failure.'

As with the decoy at Lowther Castle, Macpherson says that this one was probably in operation until the close of the eighteenth century, and it too appears not to have been a great success.

Netherby

A second book on duck decoys appeared in 1918 (Whitaker 1918). It was mainly concerned with those then still working, numbered amongst which was one in Lakeland. This was at Netherby, in what was formerly Cumberland, close to the border with Scotland. The following details are given:

Name of decoy – Silver Hill, Longtown

Traps – About 24, set at different ponds

Size of water – 12 ponds

Name of Owner – Sir Richard Graham, Bt., of Netherby

In wood of 250 acres.

Number of ducks taken from 900 to 1,000 in a season.

‘Silverhill Wood’ (as it is shown on modern 1:50,000 Ordnance Survey maps) is some 4 km west-south-west of Netherby and 3 km north-west of Longtown. The decoy ponds were located to the north-east of the minor road between Becksides and Dicktree Cottage in NY3570. One of the ponds still exists, but a visit there in April 2014 found it choked with vegetation and the surrounding area very overgrown; the other ponds were drained during the Second World War by Italian prisoners of war.

Whitaker goes on to say:

‘Sir R. Graham informs me that some traps catch better than others, and they are baited with Indian corn and chopped turnips. In 1899 he bought a lot of teal from a decoy in Somersetshire, and kept them in an enclosure with their wings clipped till the following autumn. Most of them remained when they could fly. These taught the wild ones to eat corn, which previously they would not do. For some years teal were ringed and some of these were sent to a decoy in Essex. The following year one was caught at Netherby with a ring on, another was killed off the north coast of Germany, one caught in a decoy in Wales and several on the Continent. I have also received a very interesting letter from W. Bell, the Netherby keeper. He says: “The traps are all fixtures, and should be placed in shallow water. Size of traps 21 feet on front next to water, 18 feet deep, the entrance 2 feet 6 inches wide, 3½ feet long of a tunnel shape, the end 8 or 9 inches wide. The best year was 1,233 teal, and the best take 76 teal and 2 wigeon in one trap at one time.’

This was the most northerly decoy in Britain: surprisingly there have never been any in Scotland although the construction of one was begun at Moy near Findhorn Bay but was not completed. Work on constructing the rearing ponds began in 1890 (Bleazard & Johnston 1943), just two years after Sir Richard succeeded to the baronetcy, and, as Whitaker (1918) relates, the traps, some 24 in number, were wire cages with a small, tunnel entrance, into which the birds were enticed with chopped turnips and grain.

Netherby became noted as a place where ducks were reared, the success of the enterprise being largely due to the skill of the William Bell mentioned above. In an article describing this aspect of the activities at Netherby, Bleazard & Johnston (1943) say that work on constructing the rearing ponds began in 1890 but they make no mention of a decoy. Presumably it too dates from this time (which would explain why Payne-Gallwey did not know of its existence) but this is not certain. At its height Netherby was hatching 8,000 to 10,000 Mallard *Anas platyrhynchos* a year. They later turned their attention to Teal *A. crecca*, and in the winter of 1907/08, for instance, they caught 1,133 Teal, 746 Mallard, 415 Wigeon, 61 Pintail, 6 Shoveler, 2 Gadwall, 1

Garganey and 1 Pochard, a total of 2,365 birds (Graham 1908). Breeding Teal in captivity was considered very difficult at the time but employing some of the captured birds they developed methods for doing this using pinioned birds. This was done ‘*primarily to augment and vary the game shooting*’ according to Bleazard & Johnston (1943), who go on to say ‘*In the season opening in 1902, 6,710 [Mallards] were shot on the estate, the record day’s bag of 1,317 duck being secured by seven guns which included King George V, then Prince of Wales, and Sir Richard himself.*’ This, however, is not quite the whole story, as the following extract from the *New York Times* makes clear:

‘. . . this tale . . . about some duck shooting in which the Prince of Wales and a few friends recently participated at Netherby: “The sportsmen took up their positions at three stands, on structures of branches and whins, under cover of which they were effectually concealed. The ducks had previously been drawn into a large wire netted inclosure by one of the keepers. As they have been regularly fed by the keeper the ducks had come to know him, and showed no fear in approaching him, and at feeding time they followed closely after him. The keeper liberated the ducks in batches of from eight to twelve or fifteen at a time. Immediately they soared into the air, and were shot as they passed over the guns. The total bag for the day was 1,141 ducks.’

Such activities were not confined to Netherby and several other estates were involved in the large-scale rearing of ducks for this kind of ritual slaughter (Martin 2009). Mercifully it was later banned.

In 1908 Graham began marking some of the Teal he caught or reared, initially using his own privately produced rings and later using ones supplied by the *British Birds Ringing Scheme* (the forerunner of the British Trust for Ornithology’s Ringing Scheme). Graham’s purpose in marking these birds is unclear. Perhaps it was no more than an interest in their movements, a very hot topic at the time, but, given that Netherby was primarily a sporting estate, it seems more likely that he was trying to discover how site faithful the birds were to Netherby, both within and between seasons. Sir Richard Graham died in 1932 and the whole wildfowl enterprise at Netherby seems to have come to an end shortly afterwards

Broadfield (?)

In the Sheffield family papers in the Cumbria Archive Service’s centre in Carlisle are a number of sketches *etc.* for the construction of a duck decoy (CasCat file DSHEFF/9/11). They comprise six sheets of paper, four of which show an outline of a decoy with a central pond of about two acres with four pipes. In two instances the pond is shown as circular in shape (see Figure 1), but in another two, apparently later, sketches it is shown as roughly square. The fifth and sixth sheets deal with the

dimensions of the pipes. The material available appears to be no more than preliminary thoughts on what a decoy might look like and certainly cannot be described as proper plans. By whose hand they were prepared is unknown. They are not dated, though based on the ink and style of writing, they are probably from the late 18th century or early to mid-19th century. Nor do they give any clue as to where it was intended that the decoy be built, though the family's estate at Broadfield, near Southwaite seems the most likely location. However, the family owned another estate at Burgh by Sands which, given its proximity to the Solway Firth and large numbers of wintering wildfowl, might have been a more suitable location. Either way there is no evidence that this decoy ever got much beyond the 'pipedream' stage.

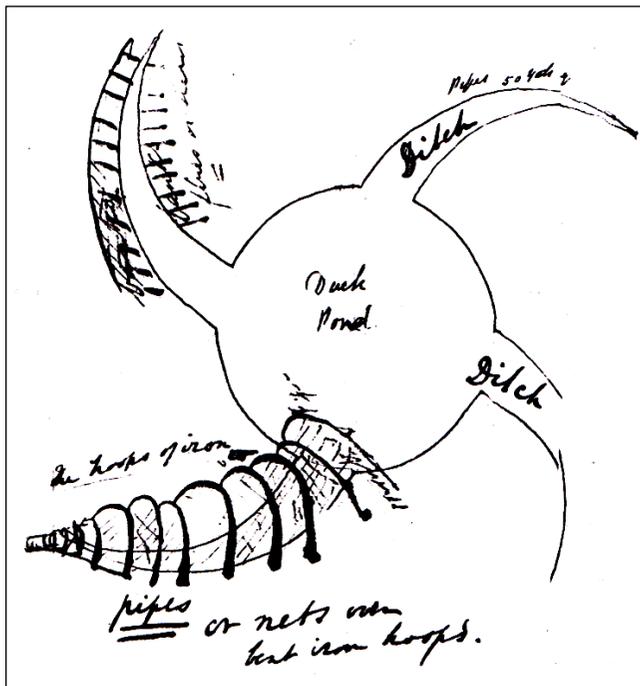


Figure 1. Sketch of proposed decoy with four pipes in the Sheffield family papers

Many questions remain about all four of the Cumbrian decoys and I would be delighted to hear from anyone who can supply further details, no matter how trivial. I would particularly like to learn more about the Netherby ringing scheme and to find out what their privately produced rings looked like.

Acknowledgements

I thank my son, Dr Thomas Sellers, for drawing attention to the presence of a decoy at Muncaster, Peter Frost-Pennington of Muncaster Castle for information about the decoy there, Ian Jack, Head Forester on the Lowther Estate, for information about the Lowther decoy and showing me the Decoy Pond at Lowther, Sir James Graham for information about Netherby and showing me round what remains of the decoys here, Jackie Clark, Head of the BTO's Ringing Scheme, for supplying information about ringing at Netherby, and Cumbria Archive Service, Carlisle Office, for allowing me to consult the Sheffield family papers and for permission to reproduce Figure 1.

References

- Bleazard, E. & Johnston, T.L. (1943) The rearing of ducks at Netherby. *Transactions of the Carlisle Natural History Society*, 6: 17-19.
- Graham, R. (1908) Letter to L.E.Hope, 29th April 1908 (handwritten transcript in Carlisle Library).
- Heaton, A. (2001) *Duck Decoys*. Princes Risborough: Shire Publications.
- Macpherson, H.A. (1892) *A Vertebrate Fauna of Lakeland*. Edinburgh: David Douglas.
- Martin, B. (2009) Duck days great and small. *Shooting Times*, 29th September 2009. (www.shootingtimes.co.uk/features/398962/Duck_days_great_and_small.html)
- Payne-Gallwey, R. (1886) *The Book of Duck Decoys, Their Construction, Management and History*. London: John van Voorst.
- Shrubb, M. (2013) *Feasting, Fowling and Feathers – A History of the Exploitation of Wild Birds*. London: T. & A. D. Poyser, pp. 213-226.
- Smith, A.H. (1967) *The Place-names of Westmorland, Part II*. Cambridge: CUP, p.184.
- Whitaker, J. (1918) *British Duck Decoys of Today, 1918*. London: Burlington Publishing Co. Ltd.

Montane fungal communities associated with Dwarf Willow on the Lakeland fell-tops

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The communities of arctic-alpine fungi found on some Scottish hills are well appreciated (e.g. Watling, 1987) but those of the Cumbrian fells have received less notice. My interest in this subject was first sparked when I read Peter Marren's account of fungi in Lakeland (Marren, 2002) and his thrown gauntlet – '*Cumbrian fungi are poorly recorded ... Many incomplete lists reveal little about the special nature of the Cumbrian fungus flora.... Among the most exciting recent discoveries is the remarkable arctic-alpine fungus flora associated with fell-fields where least willow forms dense mats*' – was an intriguing challenge.

My enjoyment of fell-walking and interest in insects and mountain plants meant I was already aware of the patches of Dwarf Willow (*Salix herbacea*) growing on some of the gravelly shoulders and tops of the fells, often adorned with the bright red galls of the sawfly *Eupontania herbacea* that develop on the leaves in summer. So whilst out on the Helvellyn fells in November 2004, I paused on the top of Raise to look for fungi growing with the Dwarf Willow that I knew there. I was somewhat underwhelmed to find just a few shrivelled specimens of a single 'small brown job'. I subsequently showed these to the late Geoff Naylor who took an active interest in fungi and he recognised them as one of the 'deceivers' (*Laccaria* species), a variable genus with several similar species. My enthusiasm was dampened but not extinguished and Geoff directed me to a web page on the 'Arctic Alpine Fungi of the English Lake District' (Taylor, 2000). This was the 'recent discovery' that Marren had referred to. John Taylor had from 1989, made a number of visits to the extensive patches of Dwarf Willow on the summit plateaux of Grasmoor and Eel Crag (named as Crag Hill on O.S. maps). His account of the fungi he found growing in mycorrhizal symbiosis with the willow there included a number of lowland woodland species and also several fungi with an arctic or alpine distribution that, in Britain, are generally restricted to mountain tops. The information on this website was also published in more detail by Taylor (2001).

The following summer I made a trip to the willow mats on Grasmoor and Eel Crag. Here I met with more success. I was struck by the incongruity of the large fruit-bodies of Common Cep (*Boletus edulis*), a familiar woodland species, towering above the inch-high canopy of the willow 'forest' in which they were growing (Plate 9a). Crouching down to photograph them, they resembled a line of radio-telescope dishes marching across the lilliputian forest landscape of the plateau. Then I found what I had

hoped to see, growing among the sharp stones of the fell top, a beautiful, elegant, snow-white *Amanita* – surely the Mountain Grisette (*Amanita nivalis*) that John Taylor had discovered new to England here in 1989! I was hooked and began to visit other areas of Dwarf Willow on the Lakeland fells.

Geoff knew John Taylor through the Northwest Fungus Group and put me in touch with him by email. John was very helpful and also put me in touch with Roy Watling at the Royal Botanic Garden in Edinburgh. Roy has taken a lead in studying mountain fungi in Britain and again gave me much generous assistance.

The fungus season begins early on the hills and I have found fungi fruiting as early as mid-July in some years. Generally though, August and September are the best months to search for fungi on the high fells, with fewer species still to be found into October. Over the last ten years I have made repeated visits to some of the more or less extensive patches of Dwarf Willow on Brandreth (NY215120), Caw Fell (NY126108), Eel Crag (NY190205), Grasmoor (NY180204), Great Dodd (NY342206), Haycock (NY144107), Helvellyn (NY338161), High Crag (NY180140), High Stile (NY169147), Hindscarth (NY215163), Kirk Fell (NY194106), Pillar (NY171121), Raise (NY343174), Rampsgill Head (NY443129), Red Pike (NY160152), Skiddaw (NY260298) and St Sunday Crag (NY369135). The genera and species of fungi that I have found growing in association with Dwarf Willow at these locations are listed below and in Table 1.

Amanita muscaria (Fly Agaric) has been found by me only twice on the fells; both occasions were on Eel Crag – on 9 September 2006 and 10 September 2009. This common woodland species is normally associated with birch trees. Taylor (2001) also lists this species for Grasmoor/Eel Crag.

Amanita nivalis (Mountain Grisette) (cover illustration) grows ectomycorrhizally with willows, birch and Alpine Bistort in arctic and sub-arctic regions. It is similar to the white form of the Grisette (*A. vaginata* f. *alba*). However it is not so tall and the cap tends to go grey or buff with age in *A. nivalis* (Knudsen & Vesterholt, 2008). This species is often one of the earlier fungi to appear on the fell tops and I have seen fruit-bodies as early as 16 July – on St Sunday Crag in 2014. Other sites are Eel Crag, Rampsgill Head and Helvellyn, with the latest date in the season being 13 September, on Grasmoor in 2008. Voucher material for several sites is deposited at Tullie House Museum.

Amanita rubescens (The Blusher) is a common woodland species that I have found growing with *S. herbacea* on the Buttermere fells at High Crag and Red Pike on 21 August 2010, and again on Red Pike on 17 September 2016.

Boletus edulis (Common Cep), as noted above, is another familiar woodland species that can occur with mountain willows, as first noted by Taylor (2001). I have found

this fungus regularly on Grasmoor, Eel Crag, St Sunday Crag and Red Pike on dates ranging between 17 August and 17 September. Sara Gomm found this species on the top of Hindscarth on 22 August 2016. [<https://www.facebook.com/groups/CarlisleNats/>]

Cortinarius species (webcaps): these occur in association with willow mats on the fells at several sites. However, this is a difficult genus and I have not attempted to name any of the specimens that I have encountered. Taylor (2001) reports *C. subtorvus*, new to Britain, and *C. anomalus* from Grasmoor/Eel Crag.

Elaphocordyceps capitata/longisegmentis (Drumstick Truffleclub) (Plate 9: c, d). I first found the distinctive clubs of this genus emerging from the ground among *S. herbacea* on Brandreth on 29 September 2005. The globular black heads of the clubs are easily over-looked, or even dismissed as sheep droppings. I identified the species as *E. capitata* on the length of its part-spores, which I measured as less than 30 µm. I did not appreciate when I found them that these fungi are parasitic on false-truffles that are themselves ectomycorrhizal with tree roots, so I went back on 8 October 2005 and excavated beneath one of the fruit-bodies to reveal a false-truffle at its base. I sent both specimens to Roy Watling who determined the truffleclub as *E. canadensis* (now known as *longisegmentis*) based on its part-spores [derived from the break-up of ascospores] being distinctly longer than those of *E. capitata*. *E. capitata* has been recorded in association with *S. herbacea* in Scotland (Watling, 1987) but apparently this is the first record of *E. longisegmentis* on the mountains. The false-truffle, although slightly immature, Roy recognised as *Elaphomyces granulatus*. I have subsequently found *Elaphocordyceps* together with *Elaphomyces* at several Dwarf Willow locations. The truffleclubs generally appear later on in the season with fruit-bodies seen on High Stile, Red Pike, Eel Crag and Hindscarth on dates between 21 August and 23 October. I again measured the part-spores of a specimen collected from High Stile on 17 September this year and found them to be in the range 8–28 µm (= *E. capitata*).

Hygrocybe salicis-herbacea (Mountain Waxcap) is an associate of *S. herbacea*, reported by Taylor (2001) from Grasmoor/Eel Crag. The species is unusual in its association with a tree species when other waxcaps are grassland species, thought to be possibly saprophagic on mosses (although apparently waxcaps are generally found in woodlands in North America!). I have found small orange-red waxcaps in the vicinity of *S. herbacea* on the fells on a number of occasions. In most instances I have identified these as *H. reidii*, *insipida* or *miniata* – grassland species whose occurrence near *S. herbacea* was merely coincidental. I did tentatively identify *H. salicis-herbacea*, which is said to resemble *H. coccinea* but to have a bitter taste (Boertmann, 1995), from Kirk Fell on 29 September 2005 and Red Pike on 15 October 2005. I sent these specimens to Roy Watling who accepted the

former but not the latter determination. However, subsequent genetic analysis has revealed that even the Kirk Fell material is not *H. salicis-herbacea* (Martyn Ainsworth, pers. comm.).

Inocybe species (fibre-caps) are frequently seen with *S. herbacea* on the fells but this is another difficult genus, well beyond my abilities to identify. Taylor (2001) reports *I. humilis* new to Britain from Grasmoor/Eel Crag.

Laccaria laccata (The Deceiver). Specimens of this and related species are the commonest associates of Dwarf Willow on the fells and the presence of the willow is often flagged by recognition of the fungi before the plant itself is noticed. *Laccaria bicolor* (Bicoloured Deceiver), which has a lilac tinge to the base of the stem, was identified by Roy Watling from material found on Grasmoor on 17 September 2005 and Brandreth on 29 September 2005. I have also recorded it on Eel Crag, Rampsgill Head, Red Pike and Skiddaw. *Laccaria proxima* (Scurfy Deceiver, formerly *L. proximella*) is considered by Taylor (pers. comm.) to be the commonest *Laccaria* on the fells. It has ovoid rather than the globose spores of *L. laccata*. I have recorded *L. proxima* from Skiddaw, Rampsgill Head, Grasmoor and Red Pike.

Lactarius nanus/hysginus/hysginoides (a milkcap). Confusion reigns (in my mind at least) over the identity of this *Lactarius* found on the fell tops. Taylor (2001) found this species on Grasmoor/Eel Crag and published it as *L. nanus*, pending confirmation. *L. nanus* is a small arctic-alpine species associated with dwarf willows that has been recorded from the Mountains of Mourne, but is (still?) not confirmed from Great Britain. Watling (pers. comm.) had previously called examples of this species from the Scottish hills *L. hysginus*, as *L. hysginoides* was then undescribed (it was only described in 1985). However, on examining specimens that I sent him from Red Pike, High Stile and Kirk Fell in 2005 he considered them to be *L. hysginoides* and confirmed this identification when I sent him further material collected on Red Pike on 21 August 2010. *L. hysginoides* is found with spruce, birch and willows in Fennoscandia, Iceland and Greenland, but is not formally recognised from Britain. I have found this *Lactarius* fairly widely with *S. herbacea* on Red Pike, High Stile, Brandreth, Kirk Fell, Hindscarth, St Sunday Crag as well as Eel Crag and Grasmoor. Dates range from late August to early October. Many of the fruit-bodies that I have found exceed the dimensions given by Heilmann-Clausen *et al.* (2000) for *L. nanus* and the instantly acrid-tasting milk also suggests *hysginus* rather than *L. hysginoides*. Similar material from other hills in Britain, more recently examined by experts, appears to be close to both *L. hysginoides* and *hysginus* but not to match either perfectly (Taylor, pers. comm.). I have also encountered specimens of smaller *Lactarius* fruit-bodies on several occasions, which may just be small versions of the same species, but one from Red

Pike in 2005 had mild-tasting milk and I do wonder if at least one other *Lactarius* species may occur.

Russula laccata (Willow Brittle-gill, formerly *R. norvegica*) is a small species (25-50mm cap diameter), distinguished by its deep red-purple cap and pure white stem (Plate 9b). It is associated with willows in the lowlands and in alpine regions, with the mountain form being smaller (Kibby, 2009). The mountain form of this species was formerly known as *R. norvegica* and this synonymisation is still doubted by some authorities. Taylor (2001) found this species once on Grasmoor and I have also found it there; as well as Red Pike on several occasions, Helvellyn, High Stile, Kirk Fell and Rampsgill Head, on dates between 21 August and 15 October.

Russula renidens (formerly *R. persicina* var. *intactor*). The variety *intactor* is known from willow beds in sand dunes and on the fells. Taylor (2001) regards this as the most frequent species of *Russula* on Grasmoor/Eel Crag. Fruit-bodies have variously shaded red caps which quickly fade to white. The stem is white, sometimes with faint pink tints and the flesh turns pinkish-rust with ferrous sulphate (Kibby, 2009). Specimens from Kirk Fell on 29 September 2005 and Red Pike on 15 October 2005 have been determined as this species by Roy Watling and I have found subsequently it on several other fell tops.

Russula subrubens (formerly *R. chamitae*). This species has a reddish cap and stem flushed pink; the colour quickly washes out to buff or white. Mature specimens develop a fishy smell and the flesh turns green with iron sulphate (Kibby, 2009). This uncommon species is associated with willow on the hills and in the lowlands. I have found it on Eel Crag on 11 September 2005 (det. Watling); Broad End, Skiddaw on 29 August 2005 and Red Pike and 21 August 2010.

Brief mention should be made of some other mountain top species. Two small but distinctive species are lichenised basidiomycete fungi, the fruit-bodies of which appear among a skim of greenish squamules on the soil surface. The deep yellow fruit-body of the Sunburst Lichen (*Lichenomphalia alpina*) makes it easily recognisable. It grows on peaty soils at altitude, usually on steep or vertical surfaces on crags or eroding path edges. I have seen it by the path between Grasmoor and Eel Crag, at the summit of Red Pike, on the ridge below the summit of High Stile and at the top of the cliffs of Eel Crag and Pillar. The second species, *L. hudsoniana*, is a rather a plain, off-white, colour but again is instantly recognisable, this time because of the more obviously lichen-like grey-green squamulose thalli, sometimes known as '*Coriscium viride*', from among which the fruit-body develops. This species is reasonably widespread, often on more level areas, on the high fells. I have recorded it from the tops of Kirk Fell, Eel Crag, Grasmoor, St Sunday Crag, High Stile, Helvellyn, Great Dodd, Skiddaw, Cross Fell in the Pennines (NY689343) and Great Shunner Fell in

North-west Yorkshire (SD8497).

I have on several occasions found a cup fungus (*Peziza* sp.) growing on the soil among *Salix herbacea*. I have not noticed it away from *S. herbacea*, but this genus is not mycorrhizal so presumably there is no direct association. A specimen from Red Pike on 21 August 2010 sent to RBGE was tentatively identified as *P. emileia* (= *howsei*) by Roy Watling, its immaturity making him a little hesitant. Other locations are Eel Crag on 10 September 2009 and 21 September 2012, Grasmoor on 21 September 2012, St Sunday Crag on 2 October 2008, Hindscarth on 5 October 2008 and High Stile on 17 September 2016.

On two occasions I have found the uncommon waxcap *Hygrocybe turunda*: on lichen-heath on top of Haycock (NY144107) on 15 August 2010 and on Grasmoor on 21 September 2012. Boertmann (1995) says this species is common in Scandinavia, Iceland and southern Greenland but is rare further south. He describes its habitat as heath-like commons on acid soils, dwarf shrub heaths and acid grasslands.

Other, generally widespread moorland fungi also occur on the tops. The Earthy Powdercap (*Cystoderma amianthinum*) and the Dung Roundhead (*Stropharia globosa*) are common upland grassland and moorland species found all over the fells. The pinkgills *Entoloma conferendum* and *E. prunuloides* occur widely, including on the tops and I have seen the attractive green *E. incanum* on Cronkley Fell (NY842283) in Teesdale on 10 September 2006. Other waxcaps are occasionally found high on the fells, including *H. reidii*, *H. psittacina*, *H. insipida*, and *H. miniata* – these are all widespread on unimproved grasslands lower down. I have only once found an earth-tongue (*Geoglossum* sp.) on the high fells – on the summit of Helvellyn. On one other occasion I found the Moor-club (*Clavaria argillacea*) – on Grasmoor on 28 August 2010.

The results of my fell-top wanderings take John Taylor's initial discovery of the arctic-alpine mycota of Grasmoor and Eel Crag and begin to describe the extent of this community in Cumbria. Although I have been able to put definite names to relatively few of the fungi that I have encountered, the results do show additional areas of *Salix herbacea* with good communities of arctic-alpine fungi on scattered fell tops across the Lake District. The best sites are the High Stile/Red Pike and Grasmoor/Eel Crag plateaux, with Brandreth, Kirk Fell, Hindscarth, St Sunday Crag and Skiddaw also having rich montane fungal communities. It is curious that despite its occurrence on several hills, I have never seen *A. nivalis* in the most species-rich communities of the Buttermere fells. There is no doubt that other sites and further species of fungi remain to be found on the Cumbrian mountains. A thorough survey of Dwarf Willow on the Lakeland fells conducted by volunteers with Cumbria Wildlife Trust (Woodhead & Woodhead, 2015) identifies additional areas of *Salix herbacea* that may well support further montane communities of fungi.

The taxonomy of fungi is in a state of flux, with new research and genetic studies,

Table 1. showing the occurrence of mycorrhizal fungi in association with *Salix herbacea* on the Cumbrian Fells

Species	Brandreth	Caw Fell	Eel Crag	Grasmoor	Great Dodd	Haycock	Helvellyn	High Crag	High Stile	Hindscarth	Kirk Fell	Pillar	Raise	Rampgill Head	Red Pike	Skiddaw, Broad End	St Sunday Crag	No. Sites for each sp.
<i>Amanita muscaria</i>			X															1
<i>Amanita nivalis</i>			X	X			X							X		X	X	6
<i>Amanita rubescens</i>								X							X			2
<i>Boletus edulis</i>			X	X						X					X	X		5
<i>Cortinarius</i> spp.				X		X									X			3
<i>Elaphocordyceps</i> sp.			X						X						X			3
<i>E. capitata</i>										X								1
<i>E. longisegmentis</i>	X																	1
<i>Elaphomyces</i> cf. <i>granulatus</i>	X		X						X	X					X			5
<i>Inocybe</i> spp.	X			X		X	X				X		X	X	X	X	X	9
<i>Laccaria</i> sp.	X		X		X		X	X	X	X	X	X	X				X	11
<i>Laccaria bicolor</i>	X	X	X	X							X			X	X	X	X	9
<i>Laccaria laccata</i>				X										X	X	X		4
<i>Laccaria proxima</i>				X										X	X	X		4
<i>Lactarius</i> sp.	X								X		X				X			4
<i>Lactarius hygginoides</i>	X		X	X					X	X	X				X		X	8
<i>Peziza howsei</i> *			X	X					X	X					X		X	6
<i>Russula</i> sp.	X									X							X	3
<i>Russula laccata</i>				X			X		X		X			X	X			6
<i>Russula renidens</i>			X	X		X	X		X		X				X	X	X	9
<i>Russula subrubens</i>			X												X	X		3
No. spp. at each site	8	1	11	11	1	3	5	2	8	7	7	1	2	6	16	7	9	

* *Peziza* spp. are not mycorrhizal but the records are included here as I have only found them among *S. herbacea* mats.

requiring constant revision of accepted classifications. The identification of montane fungi in Britain is perhaps rendered more problematic by the small amount of attention that these communities have received here. There are conflicting opinions on the names of some species, which deepens the confusion – in my mind at least! Some species that I have encountered have been fairly readily identifiable but others, including entire genera such as *Inocybe* and *Cortinarius*, are beyond me. However, I have preserved both named and un-named voucher material in the collections of

Tullie House Museum, in the anticipation that advances in the availability and use of genetic analysis will ultimately make these collections a valuable archive of the Cumbrian fell-top mycota at the beginning of the 21st century. Vouchers of material sent to Roy Watling are preserved in RBGE.

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I am sincerely grateful to John Taylor and Roy Watling for their generosity and tolerance in responding to my queries. Their kindness and patience in encouraging my interest and taking the trouble to attempt to put names to photographs and specimens, often with inadequate details supplied by me, is much appreciated. In many cases their necessarily tentative identifications were generously given to point me in the right direction and were in no way intended as definitive determinations. I hope that I have not misrepresented their opinions within this article. I also thank John for valuable comments on a draft of this article.

References

- Boertmann, D. (1995) The genus *Hygrocybe*. *Fungi of Northern Europe*, Vol. 1. Denmark: Svampetryk.
- Heilmann-Clausen, J., Verbeke, A. & Vesterholt, J. (2000) The genus *Lactarius*. *Fungi of Northern Europe*, Vol. 2. Denmark: Svampetryk.
- Kibby, G. (2009) *The genus Russula in Great Britain with synoptic keys to species*. Published on demand by blurb.com
- Knudsen, H. & Vesterholt, J. (2008) *Funga Nordica: Agaricoid, boletoid and cyphelloid genera*. Copenhagen: Nordsvamp.
- Marren, P. (2002) Fungi in Lakeland, in Ratcliffe, D.A. *Lakeland*. London: Harper Collins, pp: 328-330.
- Taylor, J. L. (2000) Arctic Alpine Fungi of the English Lake District. <http://myweb.tiscali.co.uk/fungi/mfl.htm>. Accessed 15/09/2005.
- Taylor, J. L. (2001) Arctic Alpine Fungi of the English Lake District. *Field Mycology*, 2(3): 105-107.
- Woodhead, P. & Woodhead, S. (2015) Survey of Dwarf Willow (*Salix herbacea* L.) distribution on the 'Wainright Tops' in Lakeland. *Lakeland Naturalist*, 3(1): 13-20.

Walney Island saltmarshes: recovery following pipeline construction

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The development of the North Morecambe gas field in the Irish Sea required the laying of pipelines to a reception terminal at Westfield Point near Barrow-in-Furness. Three were laid across Walney Island and the Walney Channel (in 1982, 1993, 2003) with their construction involving the clearance of corridors of saltmarsh on the east coast of Walney Island. The Walney Channel is of considerable conservation importance as a Site of Special Scientific Interest (SSSI) for its sea-grass, marine biological, and ornithological features, a RAMSAR wetland site, a Special Protection Area (SPA) under the European Union Wild Birds Directive, and an Area of Outstanding Natural Beauty (AONB).

For the first pipeline brief ecological surveys were undertaken before and after construction (Rae, 1981, 1983). Because of the conservation importance of this area, planning consent for the second and third pipelines required more comprehensive ecological studies to monitor recovery after engineering work was completed. This article reports the recovery of the vegetation in these cleared areas (cf. Tittley & Huxley, 1998, 2012).

The study area

Walney Island lies off the southwest tip of the Furness Peninsula, Cumbria, and forms an offshore barrier approximately 15 km long. The Walney Channel varies in width from a few hundred metres to a few kilometres according to location and the state of the tide. The southern end of the island has a meandering east coast of saltmarsh and sand- and mudflats, which has been stabilised in places by a sea wall and coastal road. A major change to the intertidal environment has been the spread to the area, since the 1940s, of the cordgrass *Spartina anglica* C.E.Hubb. Wylock Marsh and Snab Sands, traversed by the pipelines, slope gently to the navigation channel. The intertidal area, as much as 1.7 km wide in places, comprises a landward zone of saltmarsh to approximately 600 m offshore and beyond this a zone of sand and mud; both are crossed by meandering channels that change their positions from year to year.

Methods

Field studies on the second pipeline route commenced in the summer of 1992 before clearance in 1993 when the extents of the principal saltmarsh communities along the

corridor were measured. Recovery monitoring was undertaken in the September of each year from 1993 until 1998. Study transects were established across the corridor at right angles to the pipeline route; the first was at 2 metres from the sea-wall in species-rich saltmarsh, the second at 100 m out in *Spartina anglica* marsh, and a third at the lowest fringe of saltmarsh at 600 m out. Study quadrats were positioned along these transects at 0 m, 25 m (in the cleared corridor), 75 m (boundary areas) and 450 m (control areas) to the north and south of a centre line. Monitoring quadrats measured 3 m × 3 m and were divided into nine 1 m × 1 m smaller quadrats of which five were selected randomly for study. Species present in each were listed and their cover recorded. In 1996, 1997 and 1998 additional study quadrats were positioned along the centre and 25 m north and south lines at 25 m, 50 m, 200 m, 300 m, 400 m and 500 m from the sea-wall; these were re-visited in 2004. Pre-clearance studies for the third pipeline were undertaken in 2001; recovery was monitored in early September from 2003 until 2011. The cleared corridor was treated as a belt-transect with a permanent zero point established on its centre line at the base of the sea wall (Ordnance Survey grid reference SD20856396) near a navigation marker. The vegetation was studied across the corridor at 0 m, 25 m (cleared area), 75 m (boundary area) and 100 m (control site) to the north and south of the centre line, and along the corridor at 25 m, 50 m, 75 m, 100 m, 150 m, 200 m, 300 m, 400 m, 500 m and 600 m from the sea wall. At each point a 3 m × 3 m quadrat was established and species present were listed and their cover recorded.

Results: Second pipeline

a) Before clearance (1992)

The landward species-rich fringe of saltmarsh comprised a turf of *Puccinellia maritima* (Huds.) Parl., amongst which were patches of *Agrostis stolonifera* L., *Atriplex portulacoides* L., *Phragmites australis* (Cav.) Trin ex Steud., *Spartina anglica* and *Triglochin maritimum* L. The green alga *Blidingia minima* (Naeg.) Kylin grew epiphytic on halophytes whilst the yellow-green alga *Vaucheria compacta* (Coll.) Coll. ex Taylor formed velvety green mats among them. At 100 m from the sea-wall, *Spartina anglica* was the dominant species and formed a sward that contained *Puccinellia maritima*, *Atriplex portulacoides* and *Salicornia* spp.; green algal mats of *Ulva* (formerly *Enteromorpha*) spp. and *Rhizoclonium riparium* (Roth) Harv. occurred commonly among halophytes whilst *Blidingia minima* grew epiphytically. At 600 m the quadrats contained patchy *Spartina anglica*, occasional *Salicornia* spp. and rarely *Puccinellia maritima*. Skeins of the green algae *Ulva* (*Enteromorpha*) *flexuosa* Wulfen, *U. (Enteromorpha) prolifera* O.F. Müll. in Oeder and *Rhizoclonium riparium* were commonly present.

b) Recovery from 1993

Engineering work left a corridor of bare mud which in 1994 at 2 m from the sea wall was obvious but with patches of *Puccinellia maritima*. In 1995 this inner part of the corridor was still an obvious feature although halophyte cover had increased (Figure 1) with *Puccinellia maritima* the dominant species, accompanied by *Aster tripolium*, *Glaux maritima*, *Limonium humile*, *Spartina anglica*, *Spergularia marina*, *Suaeda maritima* and *Triglochin maritimum*. In 1996, 1997 and 1998 the 25 m north and south quadrats were almost completely covered by vegetation; the centre line was slower to recover (Figure 1); a turf of *Puccinellia maritima* contained *Armeria maritima*, *Aster tripolium*, *Plantago maritima*, *Salicornia* spp. and *Suaeda maritima*. *Spartina anglica* gradually colonised the quadrats and by 1998 had exceeded its 1992 cover values in the 25 m north and south quadrats. *Plantago maritima* was recorded less commonly in 1998 than in 1992 while *Agrostis stolonifera*, *Juncus gerardii*, and *J. maritimus* Lam. present in 1992 had not reappeared by 1998 and conversely *Atriplex hastata*, *A. portulacoides*, *Salicornia* spp. and *Suaeda maritima* absent in the 1992 quadrats were present in 1998. Reassessment in 2004 recorded 100% halophyte cover in the 25 m north quadrat while the centre line quadrat contained only 60% cover; *Puccinellia maritima* was the dominant species in both.

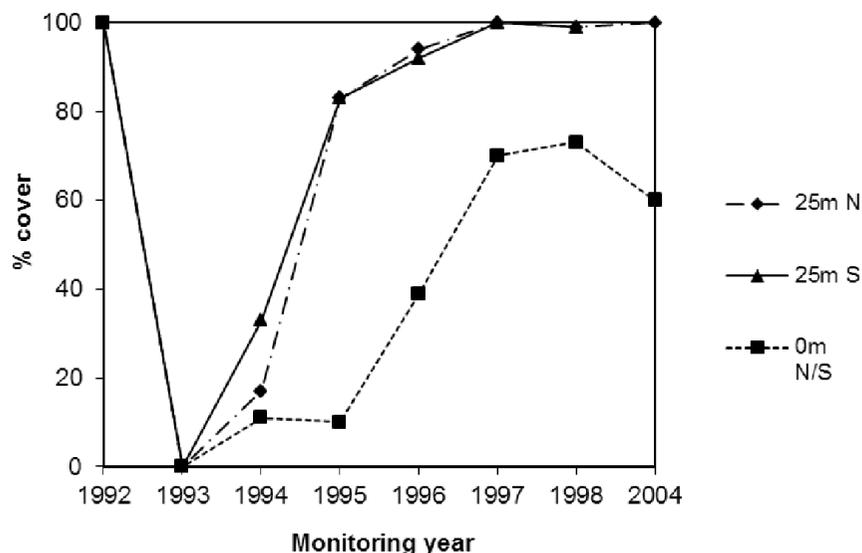


Figure 1. Transect at 2 m from the sea wall: Halophyte cover 1992-98

At 100 m from the sea wall halophyte cover gradually increased from zero in 1993 (Figure 2) while dominance changed from *Spartina anglica* in 1992 to *Salicornia* spp. in 1998; *Puccinellia maritima* was more abundant in 1998 than in 1992. By 2004

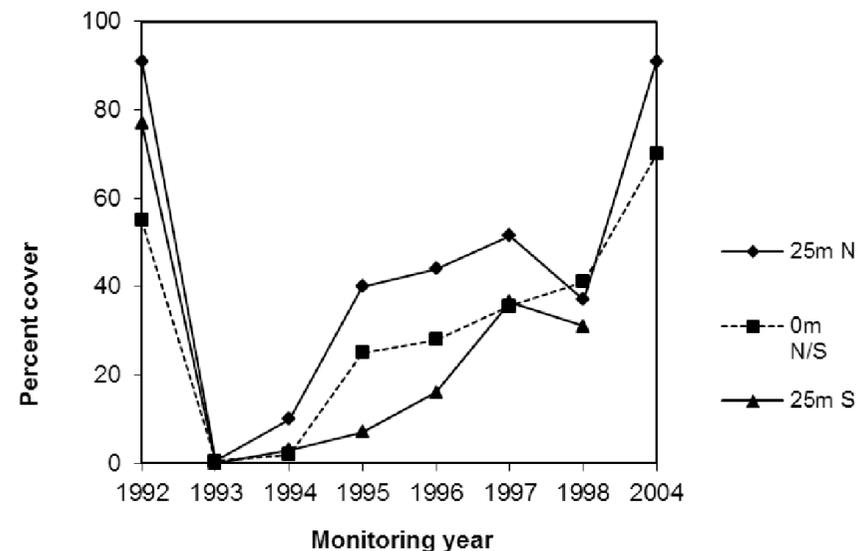


Figure 2. Transect 100 m out: Halophyte cover 1992-98 and 2004

halophyte cover had increased considerably (to 91% in the 25 m north quadrat, 70% in the centre line quadrat) with *Puccinellia maritima* the dominant species; *Spartina anglica* was more commonly present at 30% cover.

Quadrats at 600 m from the sea wall remained almost bare in 1998 containing a few *Salicornia* and *Spartina anglica* plants. By 2004, however, cover had increased to 40% (at 25 m north) and 20% (centre line) with *Salicornia* spp. the dominant feature.

In 1996 the additional quadrats studied revealed *Puccinellia maritima* forming an inshore zone giving way at 25 m out to *Salicornia* spp. as dominant from there to 600 m. By 1997 *Puccinellia maritima* was the dominant species to almost 50 m out (Figure 3) where it grew co-dominant with *Salicornia* spp. which were then the dominant component of the vegetation to 600 m. By 1998 the inshore zone of *Puccinellia maritima* had spread to 100 m out (Figure 3) where it was co-dominant with *Salicornia* spp. which was then the dominant feature to 600 m. A gradual increase in cover of *Spartina anglica* was recorded from 1996 to 1998. By 2004 *Spartina anglica* had replaced *Puccinellia maritima* which at that time had formed a zone between 100 m and 400 m from the sea wall. *Salicornia* spp. were the main component of the vegetation at 600 m. By 2011, eighteen years after clearance, the re-vegetated corridor was visually indistinguishable from the surrounding area.

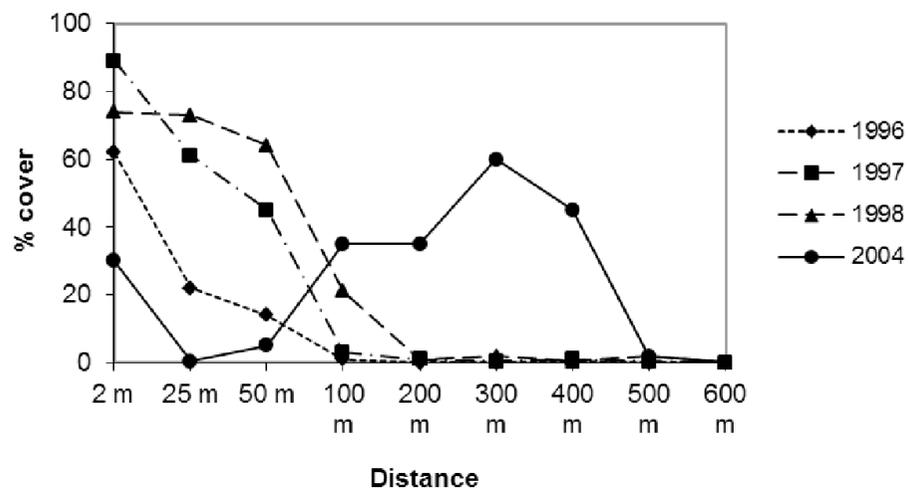


Figure 3. *Puccinellia maritima* cover on the centre line (0 m) of the cleared corridor 1996-98 and 2004

Results: Third pipeline

a) Before clearance (2001)

At successively lower levels below high water spring tide level the saltmarsh vegetation comprised: a grassy sward with *Cochlearia* spp. and *Plantago maritima*; a zone of *Juncus maritimus*; a species-rich turf of *Puccinellia maritima* and *Festuca rubra* L.; the brown algae *Fucus spiralis* L. and *Pelvetia canaliculata* (L.) Dec. & Thur. with patches of *Puccinellia maritima* and *Spartina anglica* on and among stones and cobbles. Beyond this the saltmarsh to 150 m out was characterised by *Puccinellia maritima*, with *Limonium* spp., *Salicornia* spp. and *Spartina anglica*. Further out the cover of *Puccinellia maritima* decreased as *Spartina anglica* and *Salicornia* spp. increased. *Puccinellia maritima* was absent beyond 200 m. *Spartina anglica* was most abundant between 75 m and 150 m out and *Salicornia* spp. between 75 m and 200 m. From 200 m to 400 m the vegetation was of sparse *Salicornia* spp. and skeins of *Ulva* (*Enteromorpha*) spp. From 400 m to 600 m only scattered *Salicornia* spp. and *Spartina anglica* were present.

b) Recovery

In 2011 halophyte cover in quadrats along the centre line in 2001 was similar to that in 2011 (Figure 4) although species abundances and their extents differed. Before clearance in 2001 *Salicornia* spp. were present along the corridor only from 100 m out,

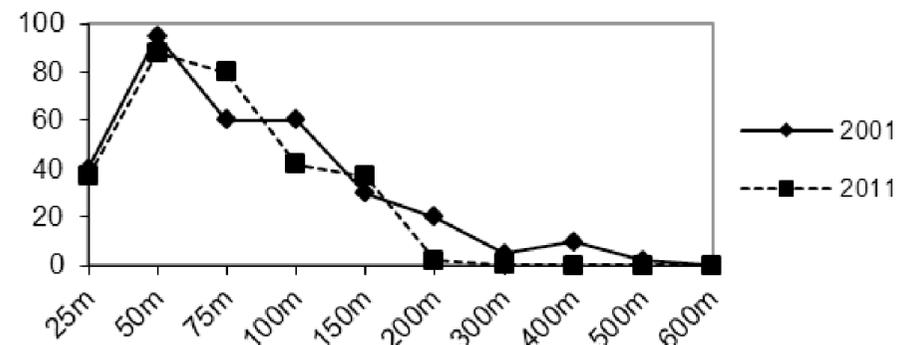


Figure 4. Halophyte cover on the centre line (0 m) in 2001 and 2011

with maximum cover at 150 m out, contrasting with 2011 when it was a feature of the vegetation to 400 m out. In 2001 *Puccinellia maritima* was the dominant inshore species and was absent until 2005 when small amounts were recorded; a gradual increase in cover and extent to 150 m out occurred in subsequent years. In 2001 *Spartina anglica* occurred sporadically along the corridor from 100 m out contrasting with later years when it was more noticeably present in the inshore area. By 2011 other species were present in the corridor with *Aster tripolium* and *Atriplex portulacoides* in small amounts to 50 m out, *Limonium humile* in small amounts to 150 m, and *Suaeda maritima* common inshore to 100 m and occasional to 300 m out. *Vaucheria* sp. was recorded patchily present, mud-binding among halophytes to 300 m while the brown algae *Pelvetia canaliculata* and *Fucus spiralis* had re-colonised stones and cobbles; the green algae *Ulva* (*Enteromorpha*) spp. returned to the cleared corridor quickly and as large skeins or mats.

Discussion

The bare corridors following engineering work were temporary features, since saltmarsh species had returned by 1998 and 2011 although their extents and abundances were not as in the pre-clearance state. The first plants recorded in both corridors were *Salicornia* spp., fulfilling their known rôle as primary saltmarsh colonisers (Chapman, 1976). The subsequent establishment of the grass *Puccinellia maritima* also follows the model of succession in saltmarsh colonisation proposed by Chapman (1976). The inshore *Puccinellia maritima* turf on both pipelines developed into a species-rich assemblage. The denser cover of *Puccinellia maritima* on pipeline 3 in 2001 than in 2011 suggests incomplete recovery. The greater cover of *Puccinellia maritima* on the second pipeline corridor in 2004, eleven years after clearance,

indicates a more advanced stage of recovery. Despite the abundance of *Spartina maritima* in the Walney Channel, it only slowly colonised the cleared corridors. The mixed *Spartina-Puccinellia* community in 2011 on pipeline 3 was the intermediate successional stage identified by Chapman (1976). Although our studies showed recovery of saltmarsh communities along both cleared corridors, further fieldwork is needed to identify whether or not the re-vegetated corridors are today distinguishable from their pre-clearance states and the surrounding undisturbed saltmarsh.

References

- Chapman, V.J. (1976) *Coastal Vegetation*. Edition 2. Oxford: Pergamon Press.
- Rae, P. (1981) *Pipeline crossing of Walney Island, Barrow-in-Furness: A preliminary ecological survey of Wylock Marsh with recommendations for reinstatement*. British Gas, London Research Station. Internal report.
- Rae, P. (1983) *Pipeline crossing of Walney Island, Barrow-in-Furness: interim report of the progress of reinstatement with an assessment of methods for revegetation*. British Gas, London Research Station. Internal report.
- Tittley, I. & Huxley, R. (1998) *North Morecambe project: Post-reinstatement ecological survey (vegetation) autumn 1998*. A report to British Gas Hydrocarbon Resources Limited. The Natural History Museum, London.
- Tittley, I. & Huxley, R. (2012) *Rivers Field Development onshore environmental recovery monitoring programme, final survey summer-autumn 2011*. A report to Conoco Phillips (UK) Limited. NHM Consulting, London.

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