

A BOTANICAL TOUR of BERWICKSHIRE



**Michael Braithwaite
2013**

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**As Vice-county Recorder for the
Botanical Society of Britain and
Ireland**

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Acknowledgements etc

Access

The writer acknowledges with deep gratitude the remarkable tolerance he has enjoyed in his recording activities from landowners and land managers. Permission for access has been sought and granted for in-by land away from footpaths but has been enjoyed as a privilege on more open land. The inclusion of records from a site must not be taken as an open invitation to visit.

Recorders

These detailed hectad descriptions of the flora would not have been possible without the contributions of generations of fellow botanists. Those who have helped in recent years include my wife Paddy, Luke Gaskell and Dr David Long. Neighbouring vice-county recorders who have contributed include Dr Roderick Corner and David McCosh. Jackie Muscott has often been accompanied on her visits by fellow members of the Edinburgh Natural History Society. The Berwickshire Naturalists' Club has also given valuable support. A number of visiting botanists have studied the aquatic flora of the river Tweed. The most recent of these have been Richard Lansdown and Timothy Pankhurst with Jane Croft and Dr Christopher Preston slightly earlier and before them Dr Nigel Holmes. Christopher Badenoch was very active across Berwickshire as a whole in the 1970's and 1980's as was Dr Albert Long as vice-county recorder in the 1950's and 1960's. This is not the place to celebrate earlier botanists except to record the outstanding contribution of Dr George Johnston in his two nineteenth century Floras and by inspiring so many fellow naturalists.

Copies of the full CBSR (see page 6) have been deposited in the following libraries

BSBI Shrewsbury, Berwickshire Naturalists' Club, Berwick upon Tweed Record Office, Heritage Hub Hawick, Kindrogan Field Studies Centre, Natural History Museum London, Natural History Society of Northumbria, Royal Botanic Garden Edinburgh, Scottish Borders Council St Mary's Mill Selkirk, The Wildlife Information Centre Gorebridge.

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About BSBI



The Botanical Society of Britain and Ireland

- Has a membership of about 3,000 amateur and professional botanists
- Is the leading charitable society promoting the study and enjoyment of British and Irish wild plants
- Maintains a network of 152 Vice-county recorders, a panel of referees for difficult plants and a central plant distribution database
- Maintains a taxonomic database that enables the list of British and Irish plants to be kept up to date
- Carries out national surveys and publishes the results, notably the *New Atlas of the British and Irish Flora*, 2002, and *Change in the British Flora, 1987-2004*
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- Holds field meetings and conferences to bring botanists together, whether amateur or professional
- Publishes journals to enable members to share their observations and the results of their studies
- Encourages the training of botanists of all ages

More information will be found on the BSBI web site at www.bsbi.org.uk

Membership and other enquiries may be sent to BSBI Honorary General Secretary, c/o Department of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD.

Introduction

This document presents, in summary narrative form, extracts from the 2013 edition of a County Botanical Site Register (CBSR) for the Vice-county of Berwickshire VC 81. The CBSR has been given limited circulation as part of a national initiative by BSBI to disseminate key plant data for conservation purposes. A condensed style of writing was adopted in the narrative so that it could be used to supplement the very detailed tables and lists of species in the CBSR. It may be helpful to give the background to the project.

The concept of a County Rare Plant Register (CRPR) has been widely accepted and a sizable minority of vice-counties now have one. All known populations of rare or scarce species are listed by species. While a printed CRPR is very useful to Vice-county Recorders and other active recorders it does not meet all their needs, nor the needs of conservationists, as so many queries are site-related rather than species-related. So the next step is to supplement the CRPR with an Excel table of the underlying data allowing it to be sorted in various ways. But there is nothing like a printed book, especially as it can include site maps and other extras, so I decided to prepare a CBSR. The Berwickshire CBSR has only been given a restricted distribution, not least because of the terms of an affordable Ordnance Survey licence. Libraries holding copies available for public view are listed on page 3.

I am making this document available on the BSBI website in the hope that it will be of interest to a wider audience than the very limited one targetted by the detailed CBSR. Berwickshire is in need of a new generation of field botanists and I would much welcome contact from those who might join in our work. I will also be glad to extract data from the Berwickshire BSBI database to try to meet the specific needs of individuals.

Although I retain the copyright of the text, I welcome not-for-profit use of this resource on paper, or electronically, for conservation and research purposes and more generally as long as its source is acknowledged as:

‘A botanical tour of Berwickshire, M E Braithwaite, 2013’.

Michael Braithwaite

November 2013

Overview of the botanical interest of Berwickshire

The botanical tour of Berwickshire is made up of a series of hectad descriptions that give very detailed accounts of the scarcer species present in the vice-county but there is only modest landscape-scale description of the countryside. The hectad descriptions were written as a commentary on a site register of the localities of individual species and their objectives were limited accordingly. I do not seek to expand on these here as this CBSR is not intended to be a full Flora of Berwickshire; it is a register of the localities of individual species with its objectives limited accordingly. Nevertheless a few words by way of a more general overview seem desirable (a slightly fuller account was published in *The Botanist in Berwickshire* 1990). The distribution maps summarising the data in the site register should be referred to conjunction with this overview.

Berwickshire is not a county with a rich flora by national or international criteria. But it has much countryside that a botanist can find it rewarding to visit and I would argue that it is an excellent study area for those seeking to sample the issues faced by our British flora in the face of man's depredations.

Berwickshire is situated approximately in the centre of Britain in a north-to-south direction, and so escapes the bias implicit in studies of botanically-rich counties in the south of England and in the highlands of Scotland. Moreover it has a good range of broad habitats. The well-represented habitats are arable land; the aquatic and riparian communities of rivers, ponds and reservoirs; sea cliffs and sea braes; improved, neutral and acid grassland; moorland; the ruderal habitats of villages and small towns, roads and railways; the wetland communities of bogs, mires, flushes and wet grassland; and, finally, both broadleaved and conifer woodland. The only under-represented habitats are typical Scottish lochs; saltmarsh and sand dunes; calcareous grassland; the ruderal habitats of cities; and montane communities; though all these have some representation.

Some habitats are in such dire condition today in relation to the native flora that they could be thought of as under-represented, but that is where the excellent historical record comes in. The well-chronicled history of change is a most valuable character of Berwickshire's flora. Study of this history is essential if the present day habitats, with their often surprising miscellany of species, are to be understood. The dire state of some habitats is not peculiar to Berwickshire.

In some habitats, particularly the riversides, neophytes now make up a significant element in the flora. Only a handful of species are involved in this change and they have been noted in the site descriptions. These prominent neophytes are not necessarily the most intrusive neophytes, indeed some of them, such as Green Figwort *Scrophularia umbrosa* and Tuberous Comfrey *Symphytum tuberosum*, are often thought of as relatively scarce native species. The adverse significance of the most intrusive neophytes varies a good deal from site to site. Thus the increasingly popular Japanese Rose *Rosa rugosa* is seen as a problem species at the coast where it self-seeds into sand, but it is not yet a problem inland as it does not seem to self-seed when planted in hedges and has only rarely formed thickets. Much the most invasive neophyte is Few-flowered Garlic *Allium paradoxum*.

The most notable botanical features of Berwickshire are its rocky coastline most famous for St Abbs Head, the river Tweed and its tributaries, the grouse moors of the Lammermuirs, a marvellous raised bog at Dogden Moss with its accompanying glacial kaims (or eskers), the sadly declining wet woodland and grassland at and around Gordon Moss, oakwoods at Abbey St Bathans and Gaitheugh and, for the discerning, the skeletal grasslands on the outcrops of the intrusive rocks of the Kelso Traps.

At species level the most notable for me are Rockrose *Helianthemum nummularium* as the county flower for its abundance on a variety of rock formations, Purple Milk-vetch *Astragalus danicus* for its abundance at St Abbs Head, Bothnian Pondweed *Potamogeton x bottnicus* and Kelso Water-crowfoot *Ranunculus x kelchoensis* as two specialist components of the rich aquatic flora of the river Tweed, Hairy Stonecrop *Sedum villosum* as the highlight of moderately acidic flush communities in the Lammermuirs, Northern Deergrass *Trichophorum cespitosum* subsp. *cespitosum* at Dogden Moss and Longmuir Moss, Coralroot Orchid *Corallorhiza trifida* at Gordon Moss, Rock Whitebeam *Sorbus rupicola* and Lily-of-the-valley *Convallaria majalis* at Gaitheugh and Maiden Pink *Dianthus deltoides* as the declining talisman of the grasslands on the Kelso traps now only impressive at Hareheugh Craigs.

Some excellent botanical features deserve wider recognition, including statutory protection. I wish to draw attention to Hareheugh Craigs with its grassland, mentioned above, Longmuir Moss with its fen and raised bog, Lumsdaine Dean and Dowlaw Moss with their mosaic of grassland and wetland communities, Cromwells with its wood pasture that is home to Northern Hawk's-beard *Crepis mollis*, the Wheel Burn as the premier example of the base-rich flush communities in the Lammermuirs and a series of flush communities in Hells Cleugh and adjacent cleughs set in some of the better managed moorland. If arable weeds are thought of as a conservation priority, attention could be directed at the abundance

of Large-flowered Hemp-nettle *Galeopsis speciosa* in the Gordon area, sometimes with a diversity of Fumitories *Fumaria* species.

While I have tried to be objective in my comment, there can be no getting away from the fact that the Berwickshire flora is in sad decline. Here are some of the key issues:

1. Many sites are small and vulnerable to what happens nearby, especially with regard to eutrophication. We inherit this habitat fragmentation from the past.
2. Little species-rich grassland is favourably managed. Some is fenced off allowing coarse grasses to take over. Some suffers from fertiliser application.
3. The notable aquatic flora of the River Tweed is not respected. The fishing interests, with few exceptions, do not exercise restraint in their weed-cutting.
4. Herb-rich moorland burnsides are too often not spared the cycle of muirburn.
5. The policy of excluding cattle from watersides has been taken too far.
6. Well-intentioned new ponds are too often dug at the cost of valuable wetland and conservation tree planting carried out at the cost of valuable grassland.

My hope is that the circulation of the CBSR and of this document will help to raise an awareness that leads to better-informed conservation actions in the countryside of Berwickshire.

References

Braithwaite, M E, and Long, D G, 1990, *The Botanist in Berwickshire*, The Berwickshire Naturalists' Club, Berwick-upon-Tweed
Braithwaite, M E, 2004, *Berwickshire Rare Plant Register*, privately circulated, Hawick

Hectad summary data

Note

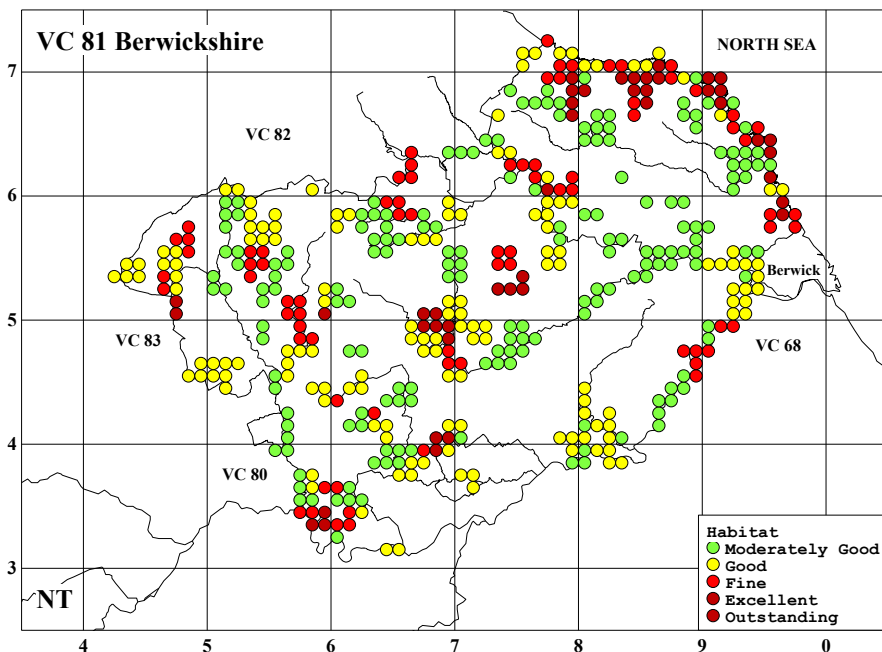
The number of sites per hectad in the table below is taken from the CBSR and does not match the tables in the hectad overviews as some of the larger sites are subdivided in the CBSR to make the units more comparable in size.

GR-NT	Hectad	Highest point	Highest point metres	Lowest point metres	Lowest point	Monads in hectad	Sites with at least moderately good habitat
44	Whitlaw	Lauder Common	378	236	Whitlaw, burn	10	4
45	Oxton	Hartside	468	207	Oxton, Leader	45	7
46	Kelphope Rig	Kelphope Rig	454	437	Kelphope Rig	[0.1]	0
53	Earlston	Black Hill	314	63	Dryburgh, Tweed	19	8
54	Lauder	Inchkeith Hill	368	116	Carolside, Leader	78	12
55	Carfraemill	Seenes Law	513	170	Lauderhaugh, Leader	100	19
56	Meikle Says Law	Meikle Says Law	532	330	Lammerlaw Burn	7	2
63	Mertoun	Brotherstone Hill	266	49	Dalcove, Tweed	47	18
64	Gordon	Knock Hill	272	131	Mark's Bridge, Eden	100	22
65	Longformacus	Blythe Edge	470	187	Longformacus, Dye	100	17
66	Cranshaws	Meikle Law	451	174	Smiddyhill, Whiteadder	16	2

GR-NT	Hectad	Highest point	Highest point metres	Lowest point metres	Lowest point	Monads in hectad	Sites with at least moderately good habitat
73	Birgham	Newton Don	85	18	Birgham Haugh, Tweed	9	3
74	Greenlaw	Kyles Hill	285	82	Bogend, Blackadder	99	14
75	Duns	Hardens Hill	360	75	Cumledge, Whiteadder	100	10
76	Abbey St Bathans	Heart Law, slopes of	365	45	Pease Bridge, burn	79	19
77	Cockburns path	Hoprig	140	0	North Sea	8	5
83	Coldstream	Homebank	52	8	Coldstream, Tweed	5	2
84	Swinton	Hirsel Law	95	3	Blount Bank, Tweed	81	10
85	Chirnside	Bunkle Edge	233	20	Hutton Hall, Whiteadder	100	10
86	Grantshouse	Drakemire Strips	268	0	North Sea	99	20
87	Dowlaw	Telegraph Hill	174	0	North Sea	6	11
94	Fishwick	Horn dean, near	54	2	Fishwick, Tweed	3	3
95	Paxton	Lamberton Moor	215	0	North Sea	53	12
96	Eyemouth	Ayton Hill	195	0	North Sea	38	19
	Berwicks. VC 81	Meikle Says Law	532	0	North Sea	1,202	249

Summary distribution maps

Sites of Botanical Interest 2013



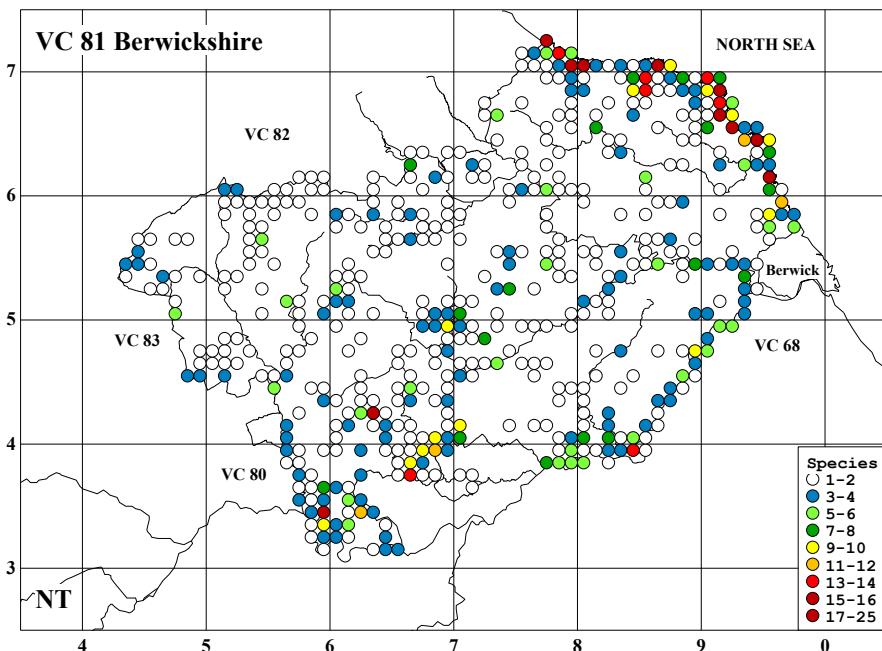
[The maps in this section have been prepared using DMAP © Dr Alan Morton]

The map of sites of botanical interest gives a flattering impression of the extent of good habitat. This is an effect of the 1km recording scale. If even a small corner of a site falls in a monad it is coloured with the grade of the site as a whole. 444 monads are mapped as of interest, an area of 44,400 hectares. The actual site areas total only 9,263 hectares which is 7.7% of the total land area of Berwickshire.

Nevertheless the main areas of botanical interest stand out clearly. From east to west these are: the whole of the coastal strip with adjacent inland habitat at Lumsdaine Dean NT86 and Pease Dean NT76, the oakwoods at Abbey St Bathans NT76, the wetland complex around Hells Cleugh near Duns NT75, Killmade Burn NT66, the grasslands of the Dye Water NT55, Dogden Moss, Fangrist Burn and Greenlaw Dean NT64, Hareheugh Craigs NT63 and NT64, Cromwells, Wheel

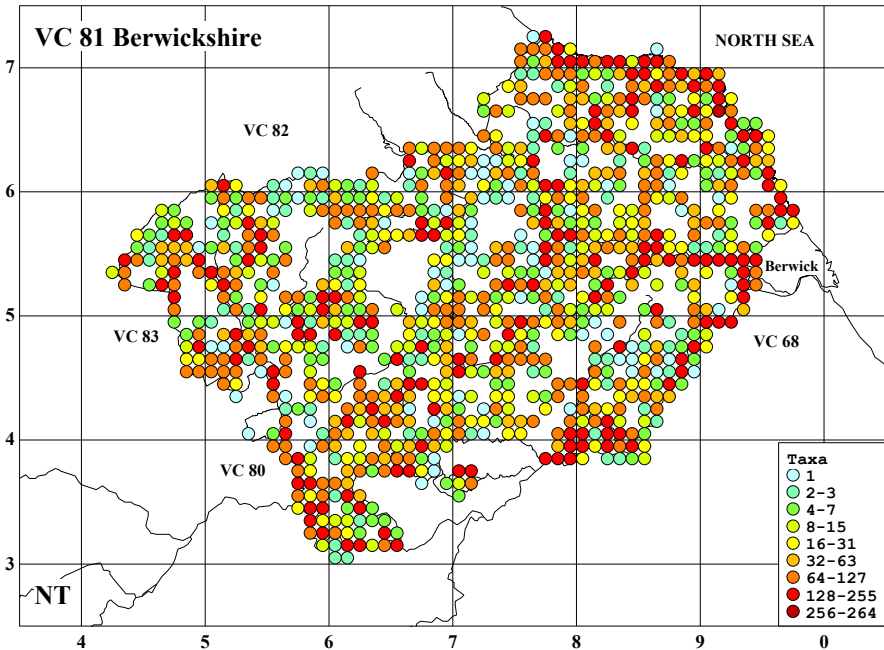
Burn and the Blythe Water NT54 and NT55, the juniper and Hairy Stonecrop *Sedum villosum* flushes of the hill burns in NT55, Gledswood and Gaitheugh NT53, Longmuir Moss NT45. The river corridors also stand out, but their botanical interest is rather dispersed, with notable examples at Fishwick Mains on the Tweed NT94 and Tibbie Fowler's Glen on the Whiteadder NT95.

Rare or Scarce Species Diversity 2013



The map of rare or scarce species diversity gives a good perspective on the paucity of species-rich botanical habitat in Berwickshire. Nevertheless criteria that dismiss species of high conservation interest solely because they are not scarce is bound to lead to contradictions. Compared to the map of sites of botanical interest the river corridors score higher as do the grasslands on the Kelso Traps in NT63 and NT64, but the preeminence of the coastal strip is even more strongly emphasised.

Taxa per Monad 2000-2013



This map underlines the limitations of the Berwickshire data. Survey has been on a sample basis, so, although there has been a strong emphasis on habitats of botanical interest, there has been no attempt at complete coverage.

There have been two similar recent sample-surveys of Berwickshire, each with fieldwork evenly spread over the vice-county. The first, carried out between 1987 and 1999, was synchronised with the needs of the *New Atlas of the British Flora*, while the second, carried out between 2000 and 2013, was rather more intensive.

Hectad Descriptions

NT44 Whitlaw

(Systematic sample surveys 1997, 2012)

Overview

Only 10% of the hectad NT44 is in Berwickshire. It lies between 236m near Whitlaw and 378m at Lauder Common. It lies on acid Silurian rocks and the vegetation is moorland at Lauder Common and grassland with small blocks of forestry at Whitlaw. Three small burns converge at Whitlaw farm. The B6362 crosses Lauder Common.

Sites with at least moderately good habitat	GR - NT
Lauder Common (part NT54)	4845, 4945, 4946, 5045, 5046, 5146

Habitats

Lauder Common is **moorland** of unprepossessing appearance. Its modest flora is of some interest as it has been less regularly burned than the Lammermuir grouse moors and patches of active *Sphagnum* survive on shallow peat with *Erica tetralix* and *Narthecium ossifragum*. The west section has small colonies of *Drosera rotundifolia* and *Vaccinium oxycoccus*. The colonies of *Narthecium ossifragum* in the acid flushes are large, exceptionally so for Berwickshire. Base-rich flushes support much *Pedicularis palustris* with a little *Equisetum sylvaticum* and *Parnassia palustris*. *Euphrasia micrantha* and *Viola lutea* occur where grass and heather meet. A sizable colony of *Lycopodium clavatum* is present on recently disturbed peat by a rough track. The east section is similar but less species-rich. The adjacent moorland-edge at Muircleugh is largely drained, though *Ranunculus hederaceus* is still present in quantity. There is a considerable list of local extinctions.

The sides of the B6362 have *Spergularia rubra* on the verge with *Juncus ambiguus* and other roadside halophytes at the edge of the tarmac.

The **burnsides** above Whitlaw are home to a large colony of *Equisetum x litorale* with a reasonable diversity of grassland and wetland axiophytes. The moorland edge above has patches of botanical interest with two colonies of *Viola lutea*. A few woodland species are found near the farm.

NT45 Oxton

(Systematic sample surveys 1997, 2013)

Overview

45% of the hectad NT45 is in Berwickshire. It lies between 207m near Oxton and 468m at Hartside Hill. There is a small area around Oxton with productive farmland on the Old Red Sandstone and from here the Leader Water can be followed to its source at Longmuir Moss. The rest is hill land which lies on acid Silurian rocks. There is improved and semi-improved grassland with wind farms at Dun Law and Carfrae Common. Part of the large area of conifer forestry on Hartside Hill is now a further wind farm. The main areas of moorland are on Clints Hill and at Headshaw Heugh.

The track of the former Lauder Light Railway runs from Oxton to Threeburnford with associated old quarries at Airhouse Wood. The A68 trunk road crosses the hectad.

Sites with at least moderately good habitat	GR - NT
Clints Hill	4253, 4353, 4354, 4453, 4454
Threeburnford, cleugh near	4652, 4653
Raughy Burn	4654, 4655, 4754, 4755
Longmuir Moss (VC 81 part, also VC 82)	4750, 4751
Airhouse Wood and Quarry	4752, 4753, 4754
Headshaw Haugh	4756, 4855, 4856, 4857

Habitats

Although the **native woodland** is fragmentary it includes fine juniper scrub at Headshaw Haugh, Raughy Burn, Airhouse Quarry and by a cleugh below Threeburnford as well as decrepit birchwood at Airhouse Wood with some hazel. The juniper at Headshaw Heugh lies on steep banks with *Erica cinerea* and *Calluna* and was associated with *Melampyrum pratense* in 1997 but this species was not refound in 2013. Flushes near the burn have colonies of *Pedicularis palustris* and *Pinguicula vulgaris*. The botanical interest continues for some distance up the Headshaw Burn. By the Raughy Burn the botanical interest is localised with the juniper largely in a dense colony on a knowe with *Helianthemum nummularium*. Airhouse Wood has small relict colonies of *Geranium sylvaticum*, *Gymnocarpion dryopteris*, *Prunus padus*, *Ranunculus auricomus*, *Rosa pimpinellifolia* and *Viola lutea* among the hazel and birches. It is now being

revitalised as woodland with plantings of oak and juniper. The quarry area adjacent has a substantial colony of native juniper.

The cleugh near Threeburnford is a fine site with a mix of interesting habitats. The juniper lies in a cleugh with *Helianthemum nummularium* and *Populus tremula*. This area has recently been fenced and planted with more juniper and a variety of other 'native species', some of which would never have occurred there naturally. A little upstream there are a series of fine **calcareous flushes** by the burn with *Dactylorhiza incarnata*, *Eleocharis quinqueflora*, *Euphrasia scottica* and *Trollius europaeus*. Steep heathy and **grassland** banks nearby have a fine colony of *Viola lutea*. Above Hartside there are similar grassy banks by the burnside with *Koeleria macrantha*, but the habitat is fragmentary.

The key **wetland** site is Longmuir Moss on the boundary with Midlothian. This is a valley mire with a raised bog on the southern half and a fen area to the north with patches of willow carr. The willows include *Salix pentandra* and *S. phylicifolia*. There is also an area of base-rich grassland on a knove by the east side. The raised bog is in good condition and where it grades into fen there is ground water movement that supports a colony of the rare Northern Deergrass *Trichophorum cespitosum* subsp. *cespitosum* amongst the *Sphagnum* with *Salix phylicifolia* nearby. The fen proper is very species-rich with much *Parnassia palustris* and *Pedicularis palustris*. It has a large colony of *Carex diandra* at its only station in Berwickshire. *Pyrola minor* occurs in the willow carr.

Further wetland occurs along the Mountmill Burn with *Carex paniculata* and *Geranium sylvaticum*, but the habitat is fragmentary.

Clints Hill is an attractive area of **acidic moorland** with screes at the west end but the specific botanical interest is very localised by small burns on the north side where crags support one young bush of juniper and where flushes support *Carex dioica* and *Selaginella selaginoides*. There is a substantial amount of *Salix aurita* scrub and a colony of *Cirsium x celakovskianum* (*C. arvense* x *C. palustre*). *Epilobium brunnescens* now occurs in a few places. The Armet Water at the foot of the hill is home to some aquatic species of acidic waters.

The **forestry** at Hartside Hill has access roads with a wide stony ditch at the margin, hewn from the hillside. Here a remarkable community has developed over several kilometres with abundant clubmosses. *Lycopodium clavatum* is the principal species present but *Diphasiastrum alpinum* is well scattered and a single plant of *Huperzia selago* has been found. *Euphrasia micrantha* is abundant in the same habitat.

In **ruderal** habitats around Oxton village *Papaver dubium subsp. lecoqii* is sometimes seen. This is thought to have been introduced with the railway. **Arable weeds** include *Galeopsis speciosa* near Threeburnford and more widely.

The A68 has the usual **roadside** halophytes. A lay-by at Red Brae has a stony bank hewn from the hillside with abundant lichens. Here *Lycopodium clavatum* has colonised but the *Diphasiastrum alpinum* which was also present appears to have died out as the open habitat is now being colonised by a wider range of species.

NT46 Kelphope Rig

Overview

Less than 0.1% of the hectad NT46 is in Berwickshire. This six hectare patch of apparently undistinguished hill grassland at NT4960 lies on acid Silurian rocks between 437m and 454m on the watershed with East Lothian and has only been viewed from afar. No botanical records are held.

NT53 Earlston

(Systematic sample surveys 1995, 2010)

Overview

19% of the hectad NT53 is in Berwickshire. It lies between 63m by the Tweed below Dryburgh and 314m at the Black Hill. The geology is largely Old Red Sandstone. Here the Leader Water runs from Carolside to Leaderfoot to join the River Tweed whose flow east from that junction is interrupted by two great bends in the river at Gledswood and Dryburgh. Most of the steep banks by the Leader and Tweed are wooded and here much of the botanical interest of the hectad is found, with further interest at the riverside itself. The two main hills, the Black Hill and Bemersyde Hill, are of intrusive rocks. Redpath Hill, now Craighouse Quarry, and the eminence near Dryburgh where Wallace's Statue stands are also of intrusive rocks.

Between the hills and the rivers there is productive farmland and the settlements of Earlston, Redpath and Dryburgh. A short section of the A68 trunk road runs north from Earlston, but little remains of the former railway track east from Earlston towards Gordon.

Sites with at least moderately good habitat	GR - NT
Carolside, south section	5539, 5639
Leaderfoot to above Redpath, Leader Water	5735, 5736, 5835
Cowdenknowes	5737
Gledswood	5734, 5834,
Gaitheugh (Gateheugh)	5833, 5933, 5934
Black Hill	5836, 5837
Bemersyde Hill, Scott's View	5933, 5934
Redpath Moss (part NT63)	5936, 6036

Habitats

The riverside **woodlands** are on the site of native woods of elm and ash with oak on the steeper banks and alder by the river. Most of the woodland is much modified by plantings but pockets of less-disturbed habitat occur on the steepest ground. There are no substantial patches of unmodified habitat by the Leader. Nevertheless the ground flora remains representative of native woodland. A speciality is *Lathraea squamaria* which is frequent on a variety of host species. A few native bushes of *Euonymus europaeus* and *Viburnum opulus* survive at the foot of crags. Likewise *Carex remota* and *Listera ovata* are but poorly represented. *Cardamine amara*, *Chrysosplenium alternifolium*, *Polystichum aculeatum* and *Prunus padus* are much more plentiful while colonies of *Hyacinthoides non-scripta*, so infrequent in Berwickshire, are more scattered. *Claytonia sibirica* and *Meconopsis cambrica* are well naturalised near the river.

Similar woodland occurs by the Tweed from Leaderfoot to Bemersyde, but here the woodland strip is deeper and much larger patches of relatively unmodified habitat survive. Gledswood is notable for *Lathraea squamaria*, *Geranium sylvaticum*, including a pale-flowered variety with deeper pink veins, and *Hyacinthoides non-scripta*, including an occasional autumn-flowering plant. There is remarkable habitat at the bend in the river below Bemersyde Hill where the dean at Halidean marks the upstream limit of the intrusive rocks. Immediately below, at Gaitheugh (now Gateheugh, but the old spelling makes it clear that this is the cliff of the wild goats), the intrusive rocks have weathered to yield unstable slopes of calcareous detritus interspersed with much more resistant rock outcrops. Many unexpected species occur here, albeit in small quantity, most notably *Arabis hirsuta*, *Astragalus glycyphyllos*, *Clinopodium vulgare*, *Convallaria majalis*, *Echium vulgare*, *Galium boreale*, *Galium sternerii*, *Juniperus communis*, *Sorbus rupicola*, *Thalictrum minus* and *Viola hirta*. The *Convallaria majalis* has only recently been discovered on a very inaccessible ledge, but it appears to be native.

The healthy colony of *Sorbus rupicola* is assuredly native. *Helianthemum nummularium* is plentiful on the calcareous detritus with a naturalised population of *Helleborus foetidus*. Woodland species of note include *Circaea x intermedia*, *Euonymus europaeus*, *Melampyrum pratense*, *Melica uniflora* and *Ranunculus auricomus*. *Melica nutans* appears to have been lost recently while the current status of *Vaccinium vitis-idaea* is unclear. *Hieracium* species of interest occur here.

The riverside itself is less notable. The **aquatic flora** is poor, though *Potamogeton x olivaceus* has twice been recorded at Gledswood and *Mimulus x robertsii* is a neophyte that is frequent on the gravels along the Leader. The **riparian flora** by the Leader has an excess of *Phalaris arundinacea* while the neophytes *Allium paradoxum*, *Doronicum pardalianches* and *Symphytum tuberosum* have spread into the woodland in abundance. By the Tweed the same neophytes are joined by *Impatiens glandulifera* and *Lysimachia vulgaris* but *Carex acuta*, *Scirpus sylvaticus* and *Senecio aquaticus* occur at Gledswood or Gaitheugh. The Turfford Burn at Earlston has much *Solanum dulcamara* at its banks

There is only a little **moorland** left on the Black Hill with a lone bush of juniper, and the **acid grassland** there is now very species-poor following nitrogen application. *Viola lutea* may or may not survive. However the screes support a large population of *Cryptogamma crispa* with *Ceratocarpus claviculata* frequent amongst whins on the screes and in the larch plantation below. Bemersyde Hill, both above and below the road at Scott's View, differs from the Black Hill despite the rather similar geology. Little of the grassland is botanically rewarding but there are patches on the most skeletal soils and at small rock outcrops with a more notable flora. These patches support good colonies of *Cerastium arvense* and the annuals *Cerastium semidecandrum*, *Filago minima*, *Scleranthus annuus*, *Spergularia rubra*, *Stellaria pallida* and *Vulpia bromoides*. The summit of Bemersyde Hill is reseeded grassland. A tiny patch of grassland on basalt above Wallace's Statue has *Cerastium arvense* and *Trifolium striatum*.

Redpath Moss is the principal **wetland** site, described here though half of it falls in hectad NT63. The habitat remains in good condition. The willow carr and associated wet grassland is home to *Carex curta*, *C. paniculata*, *Listera ovata*, *Pyrola minor*, *Silene silaus*, *Trollius europaeus* and *Vaccinium oxycoccus*. *Corallorhiza trifida* is a speciality of the moss, but was not encountered in 2010. Halidean Mill Moss is much modified but is a station for *Hippuris vulgaris*.

The **arable weed** flora is not exceptional but *Fumaria densiflora* has been recorded recently from two fields. *Erysimum cheiranthoides* and *Sinapis alba* appear to be introductions, the latter being grown as a game crop and often persisting.

Of the more **ruderal** habitats Park Quarry is interesting with a colony of *Cynoglossum officinale* on the rocky slopes and a colourful show of orchids, mainly *Dactylorhiza fuchsii*, on the old quarry floor. At Earlston *Senecio squalidus* and *Trifolium arvense* are thought to be relicts of the railway while *Malva moschata*, also about Dryburgh, may be a more-or-less naturalised introduction rather than a native.

NT54 Lauder

(Systematic sample surveys 1997, 2012)

Overview

78% of the hectad NT54 is in Berwickshire. It lies between 116m by the Leader Water by Carolside and 368m at Inchkeith Hill. This is the heart of Lauderdale with productive farmland on the Old Red Sandstone. Away from the vale, the hill land lies on acid Silurian rocks and is mainly improved grassland except for the moorland on Lauder Common.

There is a modest amount of forestry. The town of Lauder has a small industrial estate on the site of the old railway station. The policies of Thirlestane Castle lie adjacent to the town. The A68 and A697 trunk roads cross the hectad.

Sites with at least moderately good habitat	GR - NT
Lauder Common, east section, Muircleugh (see NT44)	5045, 5046, 5146
Lauder Burn	5144, 5145, 5146, 5246
Edgarhope Wood, Drummonds-hall	5448, 5449
Carolside, north section	5640
Chapel on Leader	5542, 5641, 5642
Whitslaid	5544
Boon Bridge	5545
Boondreigh Water, Dod Mill	5645, 5646, 5647, 5747, 5848
Blythe Water	5748, 5749, 5848
Pyatshaw Meadow by Brunta Burn, Blythe Water	5848
Pickie Moss	5844, 5944
Everett Moss, fen at west end of	5943

Habitats

The **mixed woodland** of alder, elm, ash and oak that is so much a feature beside the lower part of the Leader Water in NT53 continues through the policies of Carolside and Chapel on Leader to Whitslaid. More fragmentary woodland and scrub is found by the Boondreigh Water. The woods are discontinuous and much modified by plantings but botanical interest remains, especially on the steepest banks. *Prunus padus*, *Galium odoratum* and *Saxifraga granulata* are features of the woodland. *Euonymus europaeus* is present as a presumed native at Carolside and Whitslaid. Carolside also has *Cystopteris fragilis*, *Lathraea squamaria*, *Melica uniflora* and *Polypodium interjectum*. Chapel on Leader and Whitslaid have *Clinopodium vulgare* while the former adds *Pyrola minor* and the latter *Ranunculus auricomus* and *Rosa pimpinellifolia* with a further colony of *Cystopteris fragilis*. *Ranunculus auricomus* also occurs by the Boondreigh Water with *Carex remota*, *Solidago virgaurea* and a few native bushes of *Viburnum opulus*. *Allium paradoxum* and *Claytonia sibirica* have spread down the Leader Water from Boon Bridge. The *Allium* has now colonised the roadside at Dod Mill whence dispersal down the Boondreigh Water is inevitable.

There were formerly extensive oakwoods by the Earnsclough Water at Edgarhope Wood, but only a few oaks remain there at the foot of conifer plantations. Lower down the burn at Drummonds-hall there is mixed woodland at the transition from the Old Red Sandstone to the Silurian, but it is almost all plantation and the botanical interest is modest, though there are good colonies of *Chrysosplenium alternifolium*.

The **riversides** of the upper Leader and Boondreigh Waters have extensive banks of sand and gravel, with *Lepidium heterophyllum* constant. The extent of the sand and gravel increases downstream from Thirlestane Castle and is notable at Boon Bridge and up the Boondreigh Water. Here *Chenopodium bonus-henricus* and *Mimulus x robertsii* have become widely naturalised and *Rhinanthus minor* is occasional. There are pools and oxbows in places, especially up the Boondreigh Water with *Cardamine amara*, *Iris pseudacorus* and *Lychnis flos-cuculi*. The grassy banks by the Boondreigh Water are also productive botanically with *Agrimonia eupatoria*, *Alchemilla filicaulis* subsp. *vestita*, *Leontodon hispidus* and *Linum catharticum* in the more base-rich areas and a splendidly natural community of *Rosa* spp. scattered through the scrub. Taken together, the woodland, wetland and grassland interest over a three kilometre stretch make this a remarkably diverse site.

The **hill burns** are quite varied. The finest botanical feature of the hectad is the juniper scrub up the Blythe Water, the name for the upper part of the Boondreigh Water. This has recently been altered by extensive planting of juniper and the naturalness of the site has been somewhat spoilt in the process. Other species of

interest there include *Carex laevigata*, *Ceratocarpus claviculata*, *Geranium sylvaticum*, *Gymnocarpium dryopteris*, *Helianthemum nummularium* and *Solidago virgaurea*. Where the Brunta Burn runs into the Blythe Water there is a wet meadow with *Veronica x lackschewitzii*. A further meadow a little up the Brunta Burn is more natural with alders by the burn together with wetland and relatively species-rich grassland. Here there is a colony of *Cirsium heterophyllum* with *Geranium sylvaticum*.

The Lauder Burn has its source in Roxburghshire at Threeewood Moss. The upper Berwickshire sections of the burn have an aquatic flora of a type not surviving elsewhere in the county comprising *Apium inundatum*, *Callitriche hermaphrodita*, *Myriophyllum alterniflorum*, *Potamogeton alpinus* and *Sparganium emersum*. The *Potamogeton* was not refound in 2012 or 2013 but could reappear. *Senecio aquaticus* grows at the banks of the burn. Flushed areas adjacent have *Carex paniculata*, *Chrysosplenium alternifolium*, *Crepis paludosa* and *Valeriana dioica*. There are rocky places and screes near the burn with a varied flora including *Dryopteris oreades*, *Gymnocarpion dryopteris*, *Juniperus communis* and *Viola lutea*. The Harry Burn has a much less varied flora.

Lauder Common is described under hectad NT44.

There is a modest but interesting **wetland** at Pickie Moss with *Carex curta*, *Carex paniculata* and *Typha latifolia*. *Salix repens* may still survive with the *Pedicularis palustris* in the open heathy area. *Pyrola minor* grows in the willow carr. The western outflow from Everett Moss falls in the hectad. The canalised burn has a large population of *Catabrosa aquatica* and there is frequent *Carex paniculata* along its banks and in the fairly extensive fen area alongside with *Carex vesicaria*, *Galium palustre subsp. elongatum* and *Typha latifolia*. An old mill pond at Birkenside has *Catabrosa aquatica* and *Hippuris vulgaris*. A farm pond at Legerwood formerly had *Apium inundatum* and *Rumex palustris* at its muddy margins but the pond is now fenced and such mud communities have not been seen there for a considerable period though the charophyte *Nitella flexilis/opaca* agg. was recorded in 1997. A small colony of *Trollius europaeus* survives by the Washing Burn, but with few associates of note.

The **policies** of Thirlestane Castle are where Andrew Brotherston collected the nationally rare *Carex muricata subsp. muricata* on several occasions from 1874 to 1878, but it has not been seen since. Well-authenticated specimens are preserved at the Natural History Museum in London. It may have been introduced accidentally with a seed-mixture of grasses and sedges to naturalise in woodland as *Milium effusum* was recorded before 1902 and *Luzula luzuloides* and *Carex divulsa subsp. leersii* are present today. The policy woodlands have only modest botanical

interest unless *Epipactis helleborine* survives: this was seen at Standalane Plantation in 1982, the last record for Berwickshire.

The **arable fields** are well managed and arable weeds are few, though the fields at the edge of the town at Lauder have occasional weedy corners. There have been a few surprises: *Fumaria purpurea* turned up at the Golf Course in 2004 and *Bromus commutatus* near the Milsie Burn in 2007. *Galeopsis speciosa* is occasional, being much less frequent here than in the adjacent hectad NT64. *Aethusa cynapium* has been seen only as a weed below a wall at Legerwood Kirk.

The **town** of Lauder has notable high stone walls with a range of neophytes including *Euphorbia cyparissias* and *Cymbalaria muralis*. *Cymbalaria hepaticifolia* and *C. pallida* also occur around the town. *Viola tricolor* has been seen on the industrial estate and there is a wet grassy area nearby with *Achillea ptarmica*, *Lychnis flos-cuculi* and *Rhinanthus minor*.

The **roadsides** have the now-familiar halophytes including *Cochlearia danica* from 2007. The *Cochlearia* has been notably slow to colonise the A68 south from Edinburgh but is gradually becoming more widespread. *Rumex longifolius* had become quite frequent further from the tarmac by 2007 but was not seen at all in 2012, though one plant was found in 2013 at a new site. *Atriplex littoralis* has appeared on the A697 while *Juncus ambiguus* and *Sagina maritima* have colonised the nutrient-poor roadsides of the B6362 at Lauder Common. There is a remarkable colony of *Erinus alpinus* by the A68 at Chapel on Leader where it has colonised a rock cutting on the Old Red Sandstone in quantity.

NT55 Carfraemill

(Systematic sample surveys 1992, 2009)

Overview

All of the hectad NT55 is in Berwickshire. It lies between 170m by the Leader Water below Lauderhaugh and 513m at Seenes Law. While the hectad has productive farmland in Lauderdale on the Old Red Sandstone, that is only a relatively small area near the Leader Water below Carfraemill. The rest of the hectad is in the heart of the Lammermuirs on acid Silurian rocks. The land is open grouse moor dissected by a series of burns running south into the Leader Water, except in the northeast which lies across the watershed at the head of the Dye Water.

There is as yet no extensive forestry nor are there wind farms, though a line of pylons crosses the north of the hectad serviced by a well-built track. There is an established plantation at Edgarhope Wood and more recent plantings are evident in the lower sections of the hill burns, many of them orientated to the development of the shooting estates. These are now supplemented by annually-cultivated game strips or longer-term sowings and by new ponds.

Access is available up the main burns. From Dodecleugh for Kelphope Burn, from Longcroft for Soonhope and Whalplaw Burns, from Blythe for the upper Blythe Water, from Spottiswoode for the Brunta Burn and from Byrecleugh for the upper Dye Water. Tollishill gives access to the tops via the upland tracks servicing the pylons and the grouse moors. These tops include Crib Law 509m and Seenes Law 513m. Alternative hill routes are the Herring Road, an old drove road, from Burncastle and the Southern Upland Way from Wanton Walls to Twin Law.

Sites with at least moderately good habitat	GR - NT
Carfraemill, Leader Water near	5052, 5152
Addinston Hill, wet meadow north of	5155
Kelphope Burn	5157, 5158, 5159
Crib Law, south section	5259
Soonhope Burn, lower section	5255, 5354, 5355
Soonhope Burn, upper section	5356, 5357, 5358, 5359
Whalplaw Burn, lower section	5354, 5355, 5454, 5455
Whalplaw Burn, upper section	5456, 5457, 5556, 5557, 5558
Earnsclough Water	5451, 5452, 5553, 5554, 5654, 5655
Wheel Burn, Blythe Water	5650, 5651, 5750, 5751
Cromwells, Brunta Burn	5950, 5951

Habitats

The **heather moorland** is almost exclusively managed by muirburn optimised to the grouse-shooting interests. This is not a happy outcome from a botanical viewpoint as it leaves very uniform species-poor communities. While the moors can never have been at all species-rich it is the peatland communities that have suffered most. The Lammermuir peats are mostly very thin and active *Sphagnum* has now been wholly destroyed over much of the area by centuries of muirburn. Species that have suffered include *Erica tetralix*, *Eriophorum vaginatum*, *Empetrum nigrum* and *Vaccinium myrtillus*. *Narthecium ossifragum* is unknown in the hectad but is likely to have occurred in the past. *Genista anglica* is the most recent casualty and was not refound anywhere in the hectad in 2009. Its exact requirements are a little obscure but the frequency of the muirburn appears to be the main problem. Species of the drier slopes have continued to prosper, especially *Erica cinerea* which is locally abundant.

True **blanket bog** with deep peat has been almost entirely lost. There are degraded fragments at North Hart Law and Little Reds Cleugh but the *Rubus chamaemorus* once associated with them was not refound in 2009. Active *Sphagnum* does survive on a few steep north-facing banks in the cleughs and here there are small colonies of *Listera cordata* with a few plants of *Vaccinium vitis-idaea*, otherwise known only on the summit of Crib Law. Clubmosses were formerly found in the open moorland but have disappeared from that habitat, whether from the frequency of muirburn or eutrophication. However *Lycopodium clavatum*, with one plant of *Diphasiastrum alpinum*, has colonised the **stony sides of the track** servicing the pylons, especially in the passing places where the plants are little disturbed.

The burn-sides are where most of the botanical interest is concentrated. However much of the habitat away from the heather is species-poor **acid grassland**, though that in itself is a habitat of interest. Here one may savour the simple delights of *Lotus corniculatus* and *Thymus polytrichus*. There are also areas of **neutral grassland** with a wider range of species including *Helianthemum nummularium*, but these are localised. Of greater interest are the **screes and rocky places** by the burns which support healthy juniper colonies and populations of such species as *Euphrasia micrantha*, *Gymnocarpion dryopteris*, *Rosa pimpinellifolia* and *Solidago virgaurea*. The best juniper is at Dodcleugh, by the Whalplaw Burn and the Earnscleugh Water (most of the Blythe Water juniper is just south of the hectad). The dense juniper colony at Dodcleugh is composed of unusually small bushes. Some of the **cleughs** are quite rich in ferns, especially *Oreopteris limbosperma*, and are now well-colonised by *Epilobium brunnescens* but more montane species are absent. **Native woodland** is very poorly represented, with scraps of birchwood up the Soonhope Burn apparently no longer host to *Melampyrum pratense*.

The botanist soon finds himself working the burn-sides for **wetland communities** and these are far from plentiful. *Juncus articulatus* flushes are only modestly widespread and those with a base-rich influence are scarce. Nevertheless species such as *Carex disticha*, *Geum rivale* and *Valeriana dioica* are not rare. There are two types of more specialised flushes that are of special interest. First and foremost are the **open acid flushes dominated by bryophytes** where *Sedum villosum* can be plentiful. These communities are kept open by a steady flow of spring water. There are not very many of them and they may be changing. A high proportion of the *Sedum villosum* populations recorded around 20 years before were not re-found in 2009, especially those lower down the burns. The provisional conclusion is that a number have succumbed to invasion by *Juncus* species (especially *J. effusus*) perhaps mainly as a result of eutrophication. The best *Sedum villosum* flushes surviving may be the two found in cleughs off the upper Soonhope Burn. **Base-rich flushes** are even rarer. There is a fine flush in the upper Whalplaw Burn with *Eriophorum latifolium* and *Eleocharis quinqueflora* and two in the Wheel Burn, a tributary of the Blythe Water, are of a type not found elsewhere in Berwickshire with *Anagallis tenella*, *Parnassia palustris*, *Pedicularis palustris* and *Sagina nodosa*.

An interesting wetland occurs unexpectedly below Addinston Hill in the form of a substantial **wet meadow** on a heavily flushed slope. This is dominated by *Juncus acutiflorus* and *J. articulatus* accompanied by such species as *Achillea ptarmica*, *Briza media*, *Crepis paludosa*, *Geum rivale*, *Lychnis flos-cuculi* and *Valeriana dioica*, all in plenty. Unfortunately grazing has been discontinued and coarse grasses are increasing.

But there is one splendid site that refuses to fit into any simple list of habitats as it includes a **mix of woodland, woodland-edge, base-rich rocky knoves, burn-sides and flushed areas**. This is at Cromwells by the Brunta Burn and home to *Carex laevigata*, *C. pallescens*, *Crepis mollis*, *Gymnadenia conopsea*, *Helianthemum nummularium*, *Melica uniflora* with *Prunus padus* and *Saxifraga granulata* by the burn and *Hyacinthoides non-scripta* in the wood.

The hill burn-sides themselves are only modestly species-rich but below Longcroft the Cleckimin Burn has extensive **gravels** with a rather ruderal flora including plentiful *Carduus crispus*, usually thought of as a more lowland species. *Lepidium heterophyllum* is a specialty of the gravels of the Leader Water as a whole as is *Chenopodium bonus-henricus*, while *Mimulus guttatus* and *M. x robertsii* are sometimes spectacular in the **ox-bows** with *Ranunculus aquatilis*. *Mimulus x burnetii* is plentiful by the Kelphope Burn.

The **damp grassland** adjacent to the Cleckimin Burn and by the Leader Water itself has frequent *Festuca pratensis* and a little *Isolepis setacea*. Just below

Carfraemill the Leader Water has well-flushed riversides with much *Geum rivale* and *Iris pseudacorus* together with a little *Chrysosplenium alternifolium* and *Crepis paludosa*.

Edgarhope Wood is a plantation on a **former oak wood** site that still has good banks of *Hyacinthoides non-scripta*. Hazeldean Wood has *Prunus padus* as well as hazel, though the wood is only a small group of trees by the lower Kelphope Burn.

Addinston, at the very edge of the arable area, has a diverse **arable weed flora** probably reflecting the light soils and a history of periods in grass between cultivations. Species present include *Fumaria officinalis* subsp. *wirtgenii*, *Fumaria purpurea*, *Lamium amplexicaule*, *L. confertum*, *L. hybridum*, *Persicaria lapathifolia* and *Sherardia arvensis*. *Galeopsis speciosa* occurs elsewhere in the hectad on less well-drained soil.

NT56 Meikle Says Law

(Systematic sample surveys 1998, 2010)

Overview

Only 7% of the upland hectad NT56 is in Berwickshire. It lies between 330m by the Lammerlaw Burn and 532m by Meikle Says Law, 3m short of its summit in East Lothian. The land is open grouse moor in the heart of the Lammermuirs on acid Silurian rocks. In the west the Lammerlaw Burn runs between Crib Law and Lammer Law to the Kelphope Burn which in turn feeds into the Leader Water. In the east a series of burns below Meikle Says Law and Little Says Law form the headquarters of the Dye Water.

There is as yet no forestry nor are there wind farms, though a line of pylons crosses the southeast corner of the hectad serviced by a well-built track.

Tollishill gives access to the western tops and the Lammerlaw Burn via the upland tracks servicing the pylons and the grouse moors. The burns to the east can be reached by tracks from Byrecleugh on the Dye Water or from Faseney Bridge on the Faseney Water. An alternative route to Meikle Says Law is from Faseney Cottage.

Sites with at least moderately good habitat	GR – NT
Lammerlaw Burn, Crib Law, north section	5160, 5260
Wester Black Burn	5860

Habitats

The **heather moorland** is almost exclusively managed by muirburn optimised to the grouse-shooting interests. This is not a happy outcome from a botanical viewpoint as it leaves very uniform species-poor communities. While the moors can never have been at all species-rich it is the peatland communities that have suffered most. Nevertheless this hectad contains almost all the deep **blanket bog** remaining in Berwickshire. There are only modest pockets with active *Sphagnum* and these lie mainly on wet slopes. Here survive four colonies of *Rubus chamaemorus* over a total area of about ten hectares, at the relatively low altitude for this montane species of 460m to 500m.

The Lammerlaw Burn has rewards for the botanist in a series of **flushes** and with **woodland axiophytes** surprisingly well represented. The flushes near the burn are only modestly species-rich but two small side burns have excellent acid flushes with *Sedum villosum*. There also is an upland form of *Veronica serpyllifolia* with deeper blue flowers than normal on few-flowered racemes. It does not, however, correspond to *subsp. humifusa*. A third rivulet leads quite high up Crib Law to base-rich flushes with *Sagina nodosa*, *Equisetum sylvaticum*, *Parnassia palustris* and what appears to be the hybrid between *Euphrasia micrantha* and *E. scottica*. Here an upland form of *Cardamine pratensis* occurs with unusually large leaflets that feel thick and leathery to the touch. Normal, smaller, forms of this species occur alongside. There is a modestly extensive colony of *Vaccinium vitis-idaea* nearby.

The burnside below Meikle Says Law are extraordinarily species-poor, though one steep bank has *Listera cordata* in *Sphagnum*. However near Wester Black Burn there is one fine feature: a strong spring feeds a series of **acid flushes** with *Sedum villosum* and *Carex curta* with some slightly less-acid flushes adjoining.

NT63 Mertoun

(Systematic sample surveys 1995, 2011)

Overview

47% of the hectad NT63 is in Berwickshire. It lies between 49m by the Tweed below Dalcove and 266m at Brotherstone Hill.

The geology is largely Old Red Sandstone but the basaltic lavas of the Kelso traps and related intrusive rocks form most of the prominent features and are responsible for much of the botanical interest. These features are Redpath Hill, Butchercote Craigs, Brotherstone Hill, the craigs along the north side of the Eden Water near Nenthorn and Hareheugh Craigs. The botanical interest relates largely to grassland on thin soils.

The River Tweed turns south above Mertoun Bridge and near there, at the turn, steep eroding banks provide a habitat of interest. Below this is the Tweed meanders around Mertoun House with no specialist habitats on the Berwickshire bank. The substrate is Old Red Sandstone and the lack of suitable holdfasts may be the reason for the absence of most of the specialist aquatic species of the Tweed. Hollows in the rolling landform leave a varied series of wetlands at Bemersyde Moss, Whitrig Bog, Redpath Moss, Brotherstone Moss, Mincie Moss and Lurgie Loch.

There is productive farmland on the Old Red Sandstone. Small settlements are found at Clintmains and Nenthorn with the great houses of Mellerstain and Mertoun nearby with their policies. The principal roads are a short section of the A6089 near Nenthorn and the B6404 east from Mertoun Bridge. Other development is limited to a short section of former railway at Purvishaugh and the roadstone quarries at Craighouse and Blinkbonny.

Sites with at least moderately good habitat	GR - NT
Mertoun Bridge, Tweedside west of	6032
Dalcove, Tweedside near	6431, 6531
Bemersyde Moss	6033, 6133, 6134
Whitrig Bog	6234, 6235
Butchercote Craigs	6234
Brotherstone Hill	6035, 6036, 6135, 6136
Brotherstone Moss (VC 81 part, also VC 80)	6136
Redpath Moss (see NT53)	6036
Mincie Moss	6338
Mellerstain Policies, Eden Water	6438, 6439, 6538, 6539, 6639
Muckle Thairn, Little Thairn	6537, 6637
Girrick, Blinkbonny	6637, 6638, 6639, 6738
Lurgie Loch	6739
Hareheugh Craigs (see NT64)	6839
Hareheugh Craigs, craig near (see NT64)	6939

Habitats

The **grassland** of the basalt is the main feature of the hectad and is notable for its annual species, but it is much fragmented. At Butchercote Craigs the populations of the scarcer annuals on the knowes are localised but *Cerastium semidecandrum*, *Filago vulgaris*, *Montia fontana* subsp. *chondrosperma*, *Myosotis ramossisima*, *Scleranthus annuus*, *Sherardia arvensis*, *Stellaria pallida*, *Trifolium arvense*, *T. striatum* and *Vicia lathyroides* are all present and fully representative of this specialised flora. Perennial species include *Helianthemum nummularium* and *Koeleria macrantha* with *Dianthus deltoides* and *Primula veris*. The *Dianthus* is a perennial whose populations are often a mixture of long-lived plants in secure rock crevices and of more or less annual plants on sandy areas. *Viola lutea* is found on the more acid ground. *Saxifraga granulata* is technically a perennial but it reproduces mainly by bulbils which sometimes allow it to function as a pseudo-annual. There are also base-rich flushes with *Dactylorhiza incarnata* and *Carex viridula* subsp. *brachyrrhyncha*. Brotherstone Hill to the north is more acid and, while it has only a few of the annuals, it is home to a very extensive population of *Viola lutea*. Moreover it has vestiges of former moorland with an excellent population of *Genista anglica* near a tiny peat bog which has *Drosera rotundifolia* and *Vaccinium oxycoccus*. A small rock outcrop by the Covehouse Burn with *Geranium pusillum*, *Trifolium striatum* and *Vulpia bromoides* is being quarried but *Viola tricolor* is present in an arable field nearby.

A further series of sites is found to the north of the Eden Water between Mellowlees Bridge and Nenthorn. The knowes at Muckle Thairn and Little Thairn occupy an attractive site overlooking the Eden. The proportions of the annuals differ from those at Butchercote but the species are similar and include *Arabis hirsuta*, *Cerastium semidecandrum*, *Erodium cicutarium*, *Myosotis ramossissima*, *Scleranthus annuus*, *Sherardia arvensis*, *Trifolium arvense*, *T. striatum*, *Vicia lathyroides* and *Vulpia bromoides*. There is *Carex muricata subsp. lamprocarpa* alongside the *Dianthus*. The populations of *Lactuca virosa* and *Malva moschata* may well be native, though their status is sometimes debated, while *Valerianella carinata* seems likely to be a neophyte. Some wetland interest is to be found by the Eden where *Senecio aquaticus* grows along with *S. x ostenfeldii*. Girrick and Blinkbonny are home to an extensive series of knowes where the former extent of the grassland communities on the basalt is at its most apparent. At Girrick, west of the lane to Nenthorn, there are small ungrazed knowes with a little *Dianthus* and *Scleranthus*. To the east of this lane, but south of the lane to Mellowlees Bridge, the best-preserved habitat in the series lies in the field next to Girrick and along the southeast side of the triangular field to its east. Here quite large populations of *Dianthus* survive, again with *Scleranthus*. Small colonies of *Sherardia*, *Trifolium arvense* and *T. striatum* are also present with *Helianthemum* and *Saxifraga granulata* rather local. Here there are also wetland habitats, not in the best of condition, but the flushes still hold *Eleocharis quinqueflora*, *Triglochin palustre* and *Valeriana dioica*. North of the lane to Mellowlees Bridge the grassland is mainly reseeded and fertilised, but even so there is considerable interest on the small knowes with *Scleranthus* remarkably widespread along with *Geranium pusillum*. *Malva moschata* appears again here. At the A6089 there is a surprising colony of *Dianthus* on a low basalt wall and the fields towards Blinkbonny Quarry have further small colonies of *Dianthus*, *Erodium cicutarium* and *Scleranthus*. The lane to Mellowlees Bridge is itself of interest for its colonies of *Agrimonia eupatoria*, *Knautia arvensis* and *Silene vulgaris*.

Lurgie Craigs is only a small feature and, being partly ungrazed, has lost some of the habitat suitable for annuals. *Montia fontana subsp. chondrosperma* and a large colony of *Scleranthus* are found on almost bare rock ledges. East, across the Sweethope to Stenmuir road, stands Hareheugh Craigs, much the best grassland site in the hectad. Part lies in the hectad NT64 and it is described under that hectad along with a separate knowe to its east.

The **woodland** interest in the hectad is very modest. The steep river banks northwest of Mertoun Bridge have colonies of *Clinopodium vulgare*, *Origanum vulgare* and *Lactuca virosa*. The latter is also present on a cliff in the section of the wood further to the west. An eroding bank by the river has a modest colony of *Centaureum erythraea*. To the south of Mertoun Bridge there is more woodland with steep banks, but not eroding to the extent of those north of the bridge. Here,

and at the riverside below, may be found *Campanula latifolia*, *Scirpus sylvaticus*, *Senecio aquaticus* and *Stellaria nemorum*. The *Campanula* is especially fine on an island below Mertoun House. Rather similar riverside woodland is found below Dalcove where *Adoxa moschatellina* and *Chrysosplenium alternifolium* are additional species.

There is fine policy woodland at Mertoun House and Mellerstain. *Festuca heterophylla* has naturalised in such woodland at Mellerstain and there is a large colony of *Leontodon saxatilis* on a bank on the lawn above the lake.

Moorland has gone from the hectad, with the exception of the remnants at Brotherstone Hill referred to above, but there are a series of plantations and wet fields between Mellerstain and Purvishaugh that contain some natural birchwood with traces of former moorland communities. Racecourse Plantation with its mature pines is one of these. The woods at Mellerstain are attractive but again have limited continuity from former moorland rather than from any former native woodland. *Ceratophyllum claviculatum* is frequent, mainly under pines.

Although the moorland has gone a series of mosses remain with a variety of **wetland** habitats. Bemersyde Moss is a eutrophic swamp with large areas of open water. While these conditions are not conducive to a diverse flora, some species poorly represented in Bewickshire thrive. *Bidens cernua* is the most characteristic while *Cicuta virosa* has only been reported recently and may be new colonisation as would seem to be the case with *Rorippa islandica*. *Ranunculus sceleratus* is frequent. *Silene silene* holds a tenuous existence at the margin. The ponds in the nearby Whitrig Bog also have the *Bidens*, *Ranunculus sceleratus* and *Rorippa islandica*, though the latter is more plentiful by seasonal pools nearby. These pools are relicts of the substantial former wetland here that was drained to the Maidenhall Burn through a remarkable stone-lined tunnel built in the early years of the nineteenth century. Brotherstone Moss is shared with VC 80, Roxburghshire, and is willow carr with a little *Narthecium ossifragum*. Redpath Moss lies to the west and is described under hectad NT53. Mincie Moss is partly drained but the scrub includes *Salix pentandra* bushes with *S. repens* in more open areas. The ditches have a relatively varied aquatic flora with *Berula erecta*, *Callitriche hamulata*, *Ranunculus trichophyllus*, *Veronica catenata* and the charophyte *Nitella flexilis/opaca* agg..

Lurgie Loch has lost its open water and the acid bog that developed where it lay has now almost scrubbed over with birch and willow. Nevertheless some fen areas remain at the fringes with the last colony of *Stellaria palustris* in Berwickshire, here associated with *Carex lasiocarpa* which is widespread in the moss, but does not flower in shade. *Salix repens* and the hybrid *S. x ambigua* survive rather precariously in the little remaining open habitat. *Corallorhiza trifida* was rather

plentiful until recently but now seems to be rare, while *Carex curta*, *Pyrola minor* and *Salix pentandra* are more secure. *Lemna minuta* has colonised a pond at the edge of the moss.

Nenthorn House has two **ponds** fed from the Eden Water. At one of these *Potamogeton alpinus* thrives. This species was formerly known from the Eden itself. The lake at Mellerstain is also fed by the Eden and has the charophyte *Chara globularis/virgata* agg.. The *Nuphar lutea* there is probably introduced but it could have originated from the Eden nearby where *Sparganium emersum* is still present. *Scrophularia umbrosa* is frequent by the Eden. The **River Tweed** is the main habitat for aquatic species but while the Mertoun stretch has *Ranunculus pencillatus* neither *R. fluitans* nor *Potamogeton x olivaceus* have been seen recently, though they could persist. *Poa palustris* and *Rorippa x anceps* occur as introductions below Clinthill. *Lysimachia vulgaris* is now plentiful by the Tweed while *Valeriana pyrenaica* has colonised banks in wooded riverside at Mertoun House.

Though the thin soils associated with the basalt favour **arable weeds**, the reality is rather disappointing. The most dramatic find was a large population of *Fumaria purpurea* in set-aside near Lurgie Craigs in 1999. One plant of *Anthriscus caucalis* turned up unexpectedly northwest of Millfield in 2002. *Anagallis arvensis* is rare while *Galeopsis speciosa*, *Lamium amplexicaule* and *L. confertum* are occasional. *Hypericum humifusum* is occasionally found in set-aside as is *Erysimum cheiranthoides* as a probable introduction in turnips. Game crops can bring in some unexpected species such as *Sinapis alba* but it is unclear whether the large colony of *Carduus nutans* found in 2009 below Fans Hill in this habitat is an introduction or not. Its identity is also unresolved as it may all be the hybrid with *C. crispus*. Recent colonists include *Anisantha diandra* near Mellowlees Bridge and *Amsinkia micrantha* at Whittrighill.

Ruderal habitat of great interest was discovered in 2011 on an eroding bank at Dalcove. Here there is a large colony of *Hyoscyamus niger* with *Ballota nigra*, *Conium maculatum*, *Echium vulgare*, *Malva sylvestris* and *Reseda luteola*. All these plants were once used medicinally and their association is strongly suggestive of a link with the mediaeval hospital dedicated to St Mary Magdalene that stood near this spot and was destroyed by the English in 1544. There is little other ruderal interest. *Reseda luteola* seems to be about the only species of note in Craighouse Quarry. The presence of *Carex muricata* subsp. *lamprocarpa* as a colonist in the car park at Nenthorn Church relates to colonies on knowes nearby.

NT64 Gordon

(Systematic sample surveys 1987, 2007)

Overview

All of the hectad is in Berwickshire. It lies between 131m by the Eden Water above Mark's Bridge and 272m at Knock Hill.

This is gently undulating country for the most part underlain with deposits of the Upper Old Red Sandstone, but in the west at Hume Craigs there are conspicuous basaltic lavas from which two prongs project east. The first passes by Middle Third and Byrewalls to Hareford Bridge while the second, which may be earlier, forms the hill at Hexpath. In addition there are a variety of intrusive rocks of Carboniferous age known as the Kelso Traps with olivine dolerite at West Gordon, basalts at Hareheugh Craigs, Bellitaw Craigs and Knock Hill, and also some smaller plugs of conglomerate. In the extreme northeast at Spottiswoode the Old Red Sandstone gives way to Silurian rocks.

The post-glacial history of the hectad is interesting. A small part of the great eskers at Greenlaw Moor form a feature at the northeast but elsewhere there are a series of very extensive alluvial deposits indicating substantial post-glacial lakes. The largest, around Gordon Moss at 140m, extends to about 250 hectares. A second lies between Hume and Gordon and extends to about 150 hectares, again at 140m, and a third between Houndslow and Spottiswoode at 210m is much the same size. A fourth area, much smaller, lies south of Corsbie. The scale of these alluvial deposits much exceeds anything of this type elsewhere in the Scottish Borders.

The village of Gordon is the principal settlement. A main road crossing the hectad is the A697 from Coldstream to Edinburgh. The disused railway between Greenlaw and Earlston also crosses the hectad. There is a small disused quarry at the former railway station in Gordon which is now a pond.

Sites with at least moderately good habitat	GR - NT
Everett Moss	6043
Sheriffmoor Plantation	6147
Gordon Bogs, central section, Gordon Moss SSSI	6342
Gordon Bogs, central section, outwith SSSI	6242, 6342, 6442
Corsbie Fen	6244, 6245
Gordon Bogs, east section, north of Lightfield	6341, 6441
Lightfield Moor, south of Lightfield	6440, 6441
Bonarparte's Covert	6440
Gordon Meadow	6443
Gordon Community Woodland, south of old railway	6543, 6544, 6643, 6644
Gordon Community Woodland, north of old railway	6544, 6644
Halliburton, Blackadder Water near	6648, 6747, 6748, 6847, 6848
Dogden Moss (part NT65)	6749, 6849, 6949, 6750, 6850
Hareheugh Craigs (part NT63)	6839, 6840, 6940
Hareheugh Craigs, craig near (part NT63)	6939, 6940
Hume Craigs (see NT74)	6941
Rumbleton Burn (part NT74)	6945, 7045
Greenlaw Dean (part NT74)	6946, 6947, 6948, 7046
Fangrist Burn	6948, 6949

Habitats

Woodland of birch and possibly pine must have been extensive in the past, but, except as an aftermath to peat-cutting on the mosses or as fragments associated with conifer plantations, it is only well-represented in this hectad at Bonarparte's Plantation, itself recolonisation following the felling of a pine plantation. *Ceratnocabnos claviculata* is perhaps the only native species of individual interest in this habitat and is surprisingly widespread. It seems to colonise pine plantations rather readily, but is also present under birch.

The *Linnaea borealis* and former *Goodyera repens* of Bonarparte's Plantation may well have been introductions with pine seedlings from the north, though the *Linnaea* now grows under birch. The birch is ageing and site is likely to decline in interest unless colonization of scarce species occurs as pines mature. For the

present it retains a very natural feel, largely an illusion derived from the amazing luxuriance of a robust moss, *Polytrichum commune*. There is hardly a fragment of elm or oak woodland with a hint of ancient woodland flora remaining except perhaps at Gordon Common (see below) where *Chrysosplenium alternifolium* occurs near the Eden Water. *Mercurialis perennis* and *Silene dioica* are very scarce. The *Mercurialis* occurs at Hareheugh Craigs and under one roadside hedge where it may be an introduction. There is a colony of *Cirsium heterophyllum* in wet birchwood at Sheriffmoor Plantation where *Gymnocarpion dryopteris* is also present.

Heather moorland and grasslands intergrade inextricably in the Scottish Borders and together must have covered much of this hectad a few centuries ago. The moorland has been steadily reclaimed with areas on both sides of the Greenlaw to Gordon road lost shortly before 1987. An unexpected area of moor remained at Gordon Common in 1987 but is now lost, having been drained and planted as Gordon Community Woodland. This was quite species-rich and there have been a number of losses. However *Genista anglica* has thrived in the new woodland rides but unfortunately it is now threatened as the *Calluna* amongst which it grows gives way to rank grasses. There are tiny colonies of *Botrychium lunaria* and *Ophioglossum vulgatum* but these are unlikely to survive much longer under the trees. Other species present, especially near the burn, are *Berula erecta*, *Carex paniculata*, *Chrysosplenium alternifolium*, *Hydrocotyle vulgaris*, *Salix repens*, *Saxifraga granulata* and *Viola lutea*. Another moor flanked Dogden Moss. Part survives within the Greenlaw Moor SSSI, but a further part, outwith the SSSI, is now conifer plantation. The moorland habitats south of Lightfield have been progressively degraded over the years, though a few good patches of wet heath remain. *Genista anglica* may or may not survive there. *Apium inundatum* has not been seen recently but a large colony of *Lythrum portula* was discovered in 2012, which was a very wet year.

Areas of acid grassland are now restricted, with the most typical example being perhaps the north side of Knock Hill. There the species diversity is largely concentrated in flushes, except for one small knowe with *Botrychium lunaria* and *Viola lutea* which is less acid. The juniper formerly known from this site has long been extinct. The best neutral grasslands are found on the prominent geological features of Greenlaw Dean and Hareheugh Craigs. In Greenlaw Dean the Blackadder Water runs through a spectacular cut in the Old Red Sandstone especially striking at De'il's Neuk. *Helianthemum nummularium* is abundant on some of the outcrops but the associated species are rather modest with *Polygala vulgaris*, *Leontodon hispidus*, *Helictotrichon pratense* and *Hieracium* species some of the highlights. More locally *Saxifraga granulata* occurs with *Ranunculus bulbosus* and *Carex caryophyllea* while a few wet banks have modest quantities of *Geranium sylvaticum*.

Hareheugh Craigs carries some acid heath vegetation on the north side but most of the south-facing craigs are more basic and support notable colonies of *Carex muricata* subsp. *lamprocarpa* and *Dianthus deltoides*. *Helianthemum nummularium* is abundant and supports a population of the Northern Brown Argus butterfly while *Helictotrichon pratense*, *Koeleria macrantha*, three *Hieracium* microspecies and *Viola canina* with its hybrid *V. x intersita* are associates. *Scleranthus annuus* is locally plentiful on the craigs in some years, with other annuals including *Filago minima*, *Geranium columbinum*, *Montia fontana* subsp. *chondrosperma*, *Stellaria pallida*, *Trifolium striatum* and a strong population of a hybrid *Viola* now considered to be *V. arvensis x lutea* which seems to be part annual and part perennial. In the shade on the north of the craigs is a colony of *Ranunculus auricomus*. *Saxifraga granulata* and *Viola lutea* are found on the lower slopes while by the site of a medieval farmstead is a small knowe with *Cerastium semidecandrum* and *Myosotis ramosissima*. There is a further small craig to the southeast of Hareheugh with *Cerastium semidecandrum*, *Scabiosa columbaria* and *Scleranthus annuus*.

Hume Craigs is described under hectad NT74. Tiny craigs at Bellitaw, now much damaged by small-scale quarrying, carry the same flora as the nearby Hume Craigs in a depauperate form with two interesting *Cerastium* species, *C. diffusum* and *C. semidecandrum*. As a native species *C. diffusum* is nationally largely restricted to the coast but in the Scottish Borders it extends inland on these rocky knowes as far as Hawick. *Vicia lathyroides* was also present at Bellitaw but has probably now been lost. Greenlaw Kaims are of some limited interest as grassland with *Viola lutea* present. A field in Gordon village has an outcrop of the Kelso Traps and supports a fine colony of *Viola lutea*. *Anemone nemorosa* and *Conopodium majus* are also prominent there.

Roadsides and the old railway line have grassland with a certain component of neophytes, though those on the railway line are now in decline. The relative botanical poverty of the roadsides is indicated by the few small colonies of *Geranium pratense* and *Knautia arvensis* and the interest of the railway is perhaps most notable where it crosses Gordon Moss as a habitat for *Botrychium lunaria* and *Salix repens*.

No significant area of **open water** remains from the post-glacial lakes and still waters comprise a few small ponds, an amenity lake at Spottiswoode Loch and a flooded quarry at Gordon village. Their flora is very restricted. *Myrica gale* was recorded at Spottiswoode between 1951 and 1955 but is believed to have been an introduction along with *Nuphar advena* which still prospers in the loch, now with *Elodea nuttallii* as a very recent colonist while *Callitriche hermaphrodita* is found at Rumbleton.

Two river systems are represented in the hectad: the Eden Water and the Blackadder Water. The Eden Water, with its tributary the Hareford Burn, is largely canalised and sluggish and its flora is linked to that of the wetland which it drains. The aquatic flora has been losing diversity. There is now only a little each of *Ranunculus trichophyllus*, *Potamogeton crispus* and *P. natans* though *Callitriche hamulata* and *Sparganium emersum* remain more frequent. The burns towards the head of the Eden Water catchment, above and below Hexpathdean and near Meikle Harelaw, have gravel bottoms and are well colonised by *Catabrosa aquatica*. The Blackadder and its tributary the Fangrist Burn are much brisker and their beds, together with some adjacent ox-bows and ditches are remarkable for frequent large colonies of *Berula erecta* approaching its highest altitude in Britain. *Ranunculus circinatus* has been recorded here in the past. *Carex acuta* is present in the upper reaches of the Blackadder with much *C. acutiformis*.

The **wetland** habitats are diverse and sometimes important ranging from small flushes through wet meadows and haughs to extensive areas of fen and acid peat.

Gordon and Lightfield Mosses are deservedly the most famous. Here a post-glacial lake fed by numerous springs had developed into a varied wetland with wet meadows, spring mires, areas of deep peat with acid *Sphagnum* bog on top and peaty pools and channels. Peat-cutting and drainage in the eighteenth and nineteenth centuries much altered the area. Canalising the Hareford Burn in a stank in 1820 eliminated much of the open water whose margins were formerly colonised by *Lythrum salicaria*, *Ranunculus lingua*, *R. sceleratus*, *Hippuris vulgaris*, *Stellaria palustris*, *Lemna trisulca*, *Sparganium minimum*, *Utricularia minor*, *Typha latifolia*, various *Potamogeton* species and *Carex aquatilis*. Of these only *Lemna trisulca* and *Typha latifolia* now survive, these being found in small quantity in ditches and pools in Gordon Moss. The drainage allowed agricultural improvements which reduced the heath and wet meadows around the margins at Lightfield eliminating *Parnassia palustris* and *Trollius europaeus*. *Genista anglica* and *Apium inundatum* survived until recently, but the *Apium* at least seems now to have gone. *Cirsium heterophyllum* is still at Gordon Moss. Peat-cutting at Gordon Moss broke up the bog surface and when it was abandoned the cuttings became colonised by birch, creating what is now the largest birchwood in the Scottish Borders. However, much interest remains. Gordon Moss reserve was acquired for its *Platanthera bifolia* and *Coralorhiza trifida* but it also has a good variety of willows including *Salix pentandra* and *S. phylicifolia* and superb colonies of *Carex paniculata*, *C. disticha* and *Dryopteris carthusiana* together with a surprising variety of wetland and woodland habitats within an outwardly uniform woodland appearance. However the habitat has recently become much more uniform as the wetland has dried out and the open areas have wooded over. *Platanthera* has declined so much that glades have recently been cut to try to recreate suitable habitat for this orchid. The woodland element of the flora

includes a large population of *Listera ovata*, a grove of *Populus tremula*, several colonies of *Pyrola minor* and scattered *Moehringia trinervia*.

The areas outwith the wildlife reserve were under immediate sentence of change in 1987 following the then-recent agricultural drainage schemes but were still varied and interesting. The fields north of the Hareford Burn have now been drained and have lost much of their botanical interest, but those south of the burn are largely unchanged and retain good wetland habitat. There are very modest areas of bog with *Eriophorum angustifolium* and *E. vaginatum* and a little active *Sphagnum* where *Drosera rotundifolia* and *Narthecium ossifragum* are found. These grade into flushed grassland with *Filipendula ulmaria*, *Valeriana officinalis*, *V. dioica*, *Hydrocotyle vulgaris* and a variety of associates. The Tower Burn is more open and carries a large population of *Catabrosa aquatica* which in 1987 was also plentiful elsewhere round Gordon Moss in freshly cut ditches through the peat, but has since declined. Also in the Tower Burn is *Ranunculus hederaceus*, a once common species becoming relatively scarce in the county. *Apium nodiflorum* is present in a ditch to the west of the Moss, at its sole extant Berwickshire station.

Nothing of significance remains of the former wetlands between Hume and Gordon, where there were old records of *Potamogeton alpinus*, nor of the drier areas towards Hume Castle with *Genista anglica*, nor indeed of the former wetland between Houndslow and Spottiswoode. The continuing occurrence of *Catabrosa aquatica* in a ditch through the deposit of fen peat at Howlets Ha' is indicative of its wetland history. Below Corsbie something of interest does still remain. Corsbie Bog itself is a raised moss much cut-over and colonised by birch, though in 1987 it retained enough open moss to support *Vaccinium oxycoccus* and a colony of the Large Heath butterfly. It no longer supported the *Carex limosa* formerly known there. *Vaccinium oxycoccus* could not be refound in 2007, but the associated woodland still contains abundant *Dryopteris carthusiana*. To the southwest, Everett Moss is a more significant wetland. At the east end there is *Juncus acutiflorus* fen with *Valeriana officinalis*, *Equisetum fluviatile*, *Dactylorhiza purpurella* and *Carex paniculata*. This is adjoined by a large stand of *Phragmites* with *Angelica sylvestris* and *Cicuta virosa* and this in turn grades into an area with *Carex paniculata*, *Juncus* species, *Eriophorum angustifolium* and plentiful *Cicuta virosa*. Behind this is carr woodland with willow and birch associated with *Dryopteris carthusiana*. *Catabrosa aquatica* occurs in a muddy cattle pool at the margin. Curiously, *Filipendula ulmaria* appears to be absent.

An important peatland of another sort is the fine raised mire of Dogden Moss, perhaps the best preserved such mire in the Scottish Borders. The *Sphagnum* and *Eriophorum vaginatum* have but few associates though *Drosera rotundifolia* is abundant and *Empetrum nigrum* frequent. *Vaccinium oxycoccus* is constant across the whole moss, but in varying abundance, while *Narthecium ossifragum* occurs in

good quantity but more locally. The rare Northern Deergrass *Trichophorum cespitosum* subsp. *cespitosum* is present in several places and its hybrid with *T. c. subsp. germanicum*, *T. c. nothosubsp. foersteri*, is constant across much of the moss and is sometimes proliferous.

The modest-sized Jordanlaw Moss was somewhat similar but the part remaining today is small in comparison to that planted with conifers in the early 1970's. This fragment has now dried out and no bog community is left.

The richer flush communities are now rare following agricultural activities that have eliminated such species as *Parnassia palustris* at Lightfield and Rumbleton but good examples occur well up the Fangrist Burn and there are still flushes by the Rumbleton Burn with *Dactylorhiza incarnata* and pools with *Catabrosa aquatica*. The edges of the Fangrist Burn support colonies of *Blysmus compressus* and *Isolepis setacea* while small flushes carry the community characterised by *Carex dioica* and *Eleocharis quinqueflora* with *Eriophorum latifolium*, *Euphrasia scottica*, *Selaginella selaginoides*, *Parnassia palustris*, *Pinguicula vulgaris*, *Carex hostiana* and *C. viridula* subsp. *brachyrrhyncha*. The flushed areas in the haughs down the Blackadder support *Dactylorhiza incarnata* with a rich variety of associates including *Blysmus compressus*. However the best example has now been compromised by the digging of a duck pond.

The **arable weed flora** of the hectad includes *Anchusa arvensis*, *Euphorbia helioscopia*, *Fumaria muralis*, *Galeopsis speciosa*, *Lamium confertum* and *Raphanus raphanistrum*. *Galeopsis speciosa* and *Lamium confertum* are notably widespread and occasionally abundant. *Papaver dubium* and *Thlaspi arvense* are now rare but *Matricaria recutita* was found in some quantity near Gordon in 1987 and has since become more frequent. Species that are now almost confined to gardens include *Sonchus oleraceus*, *Urtica urens* and *Veronica agrestis*. Set-aside near Gordon Moss in 2007 revealed the presence of *Fumaria bastardii*, *F. densiflora*, *F. officinalis* subsp. *wirtgenii*, *F. purpurea*, *Geranium pusillum*, *Papaver dubium* subsp. *lecoqii*, *Persicaria lapathifolia* and *Viola tricolor*. *Mentha arvensis* occurs in a wet field near Gore Bridge. *Bromus hordeaceus* subsp. *longipedicellatus* was recorded by Hareford Bridge in 2007, but was not very distinct from subsp. *hordeaceus*. Overall, this is a hectad with a notably rich arable weed flora.

The **neophyte element in the flora** of the hectad was considered minimal in 1988 with *Matricaria discoidea* and *Veronica filiformis* the most evident species. This has been changing. The roadsides have been colonised by the usual range of halophytes and to a lesser extent by the native *Spergularia rubra*. *Buddleja davidii* and *Allium paradoxum* have colonised in Gordon village. *Rumex longifolius* (arguable native) has become quite widespread by roads and in damp places in the

unimproved fields, while *Dipsacus laciniatus*, *Sinapis alba* and *Phacelia tanacetifolia* have been planted as game crops. *Anisantha diandra*, *Amsinckia micrantha* and *Erysimum cheiranthoides* are new arable weeds. A paddock near Gordon Common was planted with a wildflower mix in 2007 which included *Agrostemma githago*, *Anthemis arvensis*, *Centaurea cyanus* and *Chrysanthemum segetum*. It has since been returned to grass. Recent planting at Howlets Ha' includes *Euonymus europaeus* and *Viburnum opulus*.

NT65 Longformacus

(Systematic sample surveys 1989, 2008)

Overview

All of the hectad NT65 is in Berwickshire. It lies between 187m by the Dye Water at Longformacus and 470m on Blythe Edge. While the Upper Old Red Sandstone underlies a strip at the east and south edges of the hectad, there is little productive farmland and the in-bye fields are mainly used as grass in conjunction with more extensive sheep farming, though there is a large cattle enterprise at Flass. Acid Silurian rocks underlie the rest of the hectad, except for the intrusive rocks at the Dirringtons, two hills standing apart from the Lammermuirs. Much of the Dye Water catchment is open grouse moor as is the Watch Water catchment above the Watch Water reservoir. South of Twin Law at 447m is Harecleugh Forest, a large conifer plantation, and nearby the Boondreigh Burn marks the head of the catchment of the Leader Water. The highest summit is Meikle Law at 468m to the north of the Dye Water but the upper slopes Blythe Edge to the south are a little higher.

Longformacus has diverse habitats with burnside woodland and the policies of Longformacus House as well as the ruderal habitats of the village itself. There are few arable fields in the hectad but the recent development of Horseupcleugh as a shooting estate has led to the introduction of annually-cultivated game strips or longer-term sowings. New ponds have been dug there and elsewhere.

Access is available to the upper Dye Water from Byrecleugh and to the upper Watch Water from the reservoir. The Southern Upland Way crosses the hectad from Twin Law to Longformacus.

Sites with at least moderately good habitat	GR – NT
Raecleugh	6051, 6052, 6151
Dye Water cleughs	6057, 6058, 6158
Byrecleugh	6257, 6258, 6358, 6359
Watch Water, upper section	6355, 6356, 6455, 6456, 6556
Trottingshaw, Nuns' Bank	6457, 6458, 6558
Horseupcleugh	6459, 6558, 6559, 6658
Watch Water Reservoir	6556, 6656
Dye Water, Rathburne to Wrunklaw	6658, 6757, 6758, 6857
Dogden Moss, north edge (see NT64)	6750, 6850
Watch Water, Rathburne to Watch Water Reservoir	6756, 6856
Greenlaw Kaims and burns (part NT75)	6950, 6951, 7050, 7051
Dirrington Great Law (part NT75)	6953, 6954, 6955, 7053, 7054, 7055
Crook Burn, Dyeshaugh (part NT75)	6958, 6959, 7058

Habitats

The **heather moorland** is almost exclusively managed by muirburn optimised to the grouse-shooting interests. This is not a happy outcome from a botanical viewpoint as it leaves very uniform species-poor communities. While the moors can never have been at all species-rich it is the peatland communities that have suffered most. The Lammermuir peats are mostly very thin and active *Sphagnum* has now been wholly destroyed over much of the area by centuries of muirburn. Species that have suffered include *Erica tetralix*, *Eriophorum vaginatum*, *Empetrum nigrum* and *Vaccinium myrtillus*. Species of the drier slopes have continued to prosper, especially *Erica cinerea* which is locally abundant. *Vaccinium vitis-idaea* is extraordinarily scarce. It is only on Dirrington Great Law that this species is plentiful: elsewhere there is one good colony near Byrecleugh and a few tiny patches on steep burnside banks with *Sphagnum*. These patches of *Sphagnum* are also the haunt of *Listera cordata* known in Green Cleugh and in two places up the Watch Water. *Genista anglica* occurs in small quantity on Dirrington Great Law but there is a better colony at Bog Park near Bedshiel where a rather wet area of moor with much *Erica tetralix* escapes frequent burning.

The botanical interest of the Dye Water cleughs is concentrated in the few slightly base-rich flushes. Green Cleugh has excellent colonies of *Sedum villosum* while Brock's Cleugh has *Eleocharis quinqueflora* and *Euphrasia scottica*, Stot Cleugh *Selaginella selaginoides* with *Parnassia palustris* and Hall Burn *Sagina nodosa*. The upper Watch Water has *Euphrasia scottica* in Easter Grain, an upland population of *Chrysosplenium alternifolium* and two small populations of

Parnassia palustris. *Solidago virgaurea* has one station and there is a little *Vaccinium vitis-idaea*. *Euphrasia* spp., mainly *E. confusa*, are locally abundant on the lower ground. Boondreigh Burn has one good flush with *Carex dioica*, *Eleocharis quinqueflora*, *Euphrasia scottica* and *Pedicularis palustris*. There are more acid flush communities with *Carex curta* further up the burn. Further base-rich flushes with a similar flora occur in the moorland north of Raecleugh. Additional species there include *Sagina nodosa* and *Selaginella selaginoides*. *Euphrasia micrantha* occurs in a few places on dry acid banks with sparse *Calluna* as at Heron Scar by the Dye Water where it grows with *Populus tremula*. *Epilobium brunnescens* is now widespread in the hill cleughs.

Lycopodium clavatum is almost absent from the moorland, with just a few plants near tracks by the Dye Water, but has colonised quite freely on the stony ditch-banks by forestry tracks in Harecleugh Forest where it is accompanied by a little *Diphysastrum alpinum*.

Grassland communities replace the *Calluna* lower in the Dye and Watch Water valleys and there are some excellent examples of communities that favour skeletal soils. Nuns' Bank below Trottingshaws carries fine populations of *Helianthemum nummularium* and this community is repeated by the Wester Burn at Horseupcleugh and down the Dye to Wrunklaw. On banks above the Wester Burn there are several colonies of *Vicia orobus*, at its sole surviving Berwickshire station, and one of *Antennaria dioica*. *Gymnadenia conopsea* is present but rare. Other well-represented species of interest are *Aira caryophyllea* and *Carex caryophyllea* while *Rosa pimpinellifolia* occurs on rock ledges above Wrunklaw. Similar grasslands are found near the Watch Water between Rathburne and the reservoir, again with *Antennaria dioica* and *Rosa pimpinellifolia*. *Euphrasia* spp, particularly *E. confusa*, may be abundant in the acid grasslands at the moorland edge. There is a colony of *Viola lutea* on Greenlaw Kaims.

Ancient woodland is rare in the hectad, with the Dye Water burnside the best example. The trees present include much birch and alder with some oak, elm and ash as well as introduced species. *Sambucus racemosa* has naturalised rather widely. Former woodland is indicated by an unexpected colony of *Phegopteris connectilis* on a wet bank near Trottingshaw. Between Wrunklaw and Rathburne, *Carex laevigata* occurs in what is, in effect, a wet woodland-edge community while *Salix phylicifolia* is quite frequent by the Dye Water from above Wrunklaw to near Rathburne. *Rubus saxatilis* is found under a rock by a shady pool at Heron's Hole. Hereabouts *Cardamine amara*, *Equisetum sylvaticum*, *Gymnocarpion dryopteris*, *Prunus padus* and *Solidago virgaurea* are more or less frequent. *Cirsium heterophyllum* is present with *Populus tremula* near the foot of Watch Water. *Geranium sylvaticum* is notably plentiful right through to Longformacus with a little *Adoxa moschatellina*, *Campanula latifolia* and

Ceratocapnos claviculata. Longformacus strip, to the north of the village, is a beech plantation with old trees and some birch. Here *Pyrola minor* flourishes and a small clump of *Carex muricata* subsp. *lamprocarpa* survives.

There are several **wetland** habitats additional to the flush communities of the cleughs. The north edge of the raised mire at Dogden Moss falls in the hectad and here the lagg is especially well preserved and *Vaccinium oxycoccus* occurs in peaty areas between the mire proper and the kaims. Just north of the kaims there is a network of small burns and wetland, part drained, indicative of a former glacial lake. Here *Carex dioica*, *Dactylorhiza incarnata*, *Eleocharis quinqueflora*, *Euphrasia scottica*, *Sagina nodosa*, and *Selaginella selaginoides* are present in the flushes where *Parnassia palustris* is rather fine. *Salix repens* is occasional. The burns themselves have frequent *Veronica x lackschewitzii* with *Berula erecta*, *Callitriche hermaphroditica* and *Ranunculus trichophyllus*. *Blysmus compressus* by the Fangrist Burn is an outlier of the main colonies downstream. *Genista anglica* has a good colony at Bog Park where a wet area of moor with much *Erica tetralix* escapes frequent burning. Polwarth Moss to the east has what is probably the largest colony of *Salix repens* in Berwickshire. A very different community occurs by the Crook Burn, Dyeshaugh where a bank with a strong spring line has wet areas with *Carex paniculata*, *Cirsium heterophyllum* and a fine colony of *Trollius europaeus*. By the Millknowe Burn northeast of Bedshiel there is a wet field with a large population of *Ophioglossum vulgatum*.

The **open water** of Watch Water Reservoir has much *Littorella uniflora* and *Ranunculus peltatus* while *Lythrum portula* occurs near the boathouse and the charophyte *Nitella flexilis* has been recorded. Grazing is excluded from the banks of the reservoir and here *Salix repens* is rather frequent with *Equisetum sylvaticum* amongst the un-burnt heather.

Arable weeds are poorly represented in the hectad for want of habitat. *Galeopsis speciosa* is found near Longformacus and Westruther while *Lamium confertum* has been recorded near Watch Water Reservoir. Game crops near Horseupcleugh include *Secale cereale* and *Phalaris arundinacea*.

Neophytes naturalised near Longformacus include *Claytonia sibirica* by the Dye Water, *Scilla lilio-hyacinthus* in several places in the policies of Longformacus House and *Allium paradoxum* in the village. *Veronica polita* occurs as a garden weed at Longformacus and Westruther.

The **roadsides**, especially the B6456, have the usual halophytes, *Atriplex prostrata*, *Puccinellia distans* and *Spergularia marina*, and also, near Bedshiel, *Juncus ambiguus*.

NT66 Cranshaws

(Systematic sample surveys 1998, 2011)

Overview

Only 16% of the upland hectad NT66 is in Berwickshire. It lies between 174m by the Whiteadder Water below Smiddyhill and 451m on the slopes of Meikle Law in the heart of the Lammermuirs. Much of the land is open grouse moor or grassland on acid Silurian rocks but the southeast corner below Smiddyhill is on the Old Red Sandstone and is cultivated. In the west a modest area of land near Meikle Law drains to the Dye Water. The remainder drains to the Whiteadder Water. The Whiteadder Reservoir and the north side of the Whiteadder around 'The Bell', a birchwood, fall in the vice-county of East Lothian, though The Bell is now in the Scottish Borders Region.

There are a series of forestry shelter belts around Cranshaws House and a long-established pond. Some smaller ponds have been dug there quite recently.

Cranshaws hamlet boasts a church.

Sites with at least moderately good habitat	GR - NT
Killmade Burn, Rough Cleugh (VC 81 part, also VC 82)	6561, 6661, 6662, 6663
Hare Burn	6963

Habitats

The modest area of **species-poor moorland** near Meikle Law that falls in the hectad has two small populations of *Vaccinium vitis-idaea*.

Below Duddy Bank there are modest flushes by Crow Cleugh and Little Crow Cleugh and the heathery banks here have a good colony of *Lycopodium clavatum*, recorded here in 1967, 1983 and 2010 giving it a continuity that is unusual in Berwickshire. *Vaccinium vitis-idaea* grows nearby at 300m. Two colonies of *Sedum villosum* found in 1983 had disappeared by 2010. *Carex dioica* and *Euphrasia scottica* are present in small quantity in flushes up Little Crow Cleugh.

Killmade Burn, with its associated cleughs, is perhaps the finest **hill burn** in Berwickshire with vestiges of woodland and small base-rich flushes. Only the east bank is in the vice-county but similar habitat occurs on both banks. There is birchwood near the foot of the burn and, much further upstream above Rough Cleugh, there is a narrow wooded gorge with a little *Prunus padus*. *Geranium*

sylvaticum, *Gymnocarpion dryopteris* and *Solidago virgaurea* are also found in the gorge with *Hyacinthoides non-scripta* in the cleughs nearby. There are a series of flushes near the burn but much the most species-rich is near the foot of Rough Cleugh with *Carex dioica*, *Eriophorum latifolium*, *Euphrasia scottica* and *Selaginella selaginoides*. A little *Antennaria dioica* was seen in 1998 on a dry bank close by, but was not refound in 2010. *Sedum villosum* was found in two places by the main burn in 1998 but was only refound in very small quantity at one of these in 2000 and not at all in 2010. A steep bank near Berrybank Wood and not far from the foot of Killmade Burn has a small colony of *Vaccinium vitis-idaea*. Hinds Cleugh to the east is much less interesting. Near the foot of Hinds Cleugh *Lycopodium clavatum* grows at the top of a small scree slope and *Spergularia rubra* is to be found on a sandy track.

The Whiteadder downstream of Killmade Burn has a number of haughs which are very incompletely drained and some **wetland** species are in evidence such as *Potentilla palustris*, *Ranunculus aquatilis*, *R. peltatus*, *Senecio aquaticus* and *Veronica scutellata*. The Whiteadder itself is colourful with *Mimulus* species including *M. luteus* (*sensu* Stace). Below Cranshaws the haughs are on the Old Red Sandstone and have a very different flora with **grassland** species such as *Anthyllis vulneraria*, *Leontodon hispidus* and *Rhinanthus minor*. However there is little such habitat as the haughs are cultivated. *Linaria vulgaris* grew on a crag by the Whiteadder at the foot of Howbog Burn but could not be refound in 2011. The crumbling face of the crag is very wet and has a good colony of *Pinguicula vulgaris*. *Ceterach officinarum* grew on Smiddyhill Bridge in 1986, but it was lost when the bridge was repointed a few years later.

The **policies, shelter belts and small burns** around Cranshaws House have but modest botanical interest. *Potamogeton obtusifolius* was found in the main pond in 1997. *Hypericum humifusum* and *Equisetum sylvaticum* are present by the Well Burn where *Rubus spectabilis* is all-too-well naturalised in a small dean.

On the hill behind Cranshaws, both Long Cleugh and Quarrel Cleugh have acid flush communities where *Viola palustris* is rather plentiful with a little *Equisetum sylvaticum*. *Lycopodium clavatum* was found in 2011 on a bare area by a small broken dam.

Only the south bank of the Hare Burn is in Berwickshire but it is this bank which boasts the best **flush communities** with much *Pedicularis palustris*. *Euphrasia scottica*, *Narthecium ossifragum* and *Pinguicula vulgaris* are also present.

The **arable** fields are not very rich in weeds except for one steep field near Smiddyhill with *Fumaria purpurea*, *Galeopsis speciosa* and *Persicaria lapathifolium*.

NT73 Birgham

(Systematic sample surveys 1995, 2011)

Overview

Only 9% of the hectad NT73 is in Berwickshire. It lies between 18m by the Tweed below Birgham Haugh and 85m at Newton Don. It falls into two separate main sections: that around the mansion at Newton Don and that around the village of Birgham. Separate again are some tiny parcels of land which are not considered here.

Stichill Linn on the Eden Water at Newton Don marks the boundary between the basalt lavas of the Kelso Traps and the Carboniferous sandstones and is an unexpectedly dramatic feature in a gentle landscape. The basalt is exposed on the banks above the north side of the burn and at knowes in the fields towards Stichill which fall in Roxburghshire. The park at Newton Don lies on the Carboniferous. The Carboniferous sandstones continue east to Birgham and, just below Birgham, there is a limestone feature on the north bank of the Tweed at the boundary with hectad NT83.

Newton Don is set in fine landscape and there is botanical interest in its policies. Birgham Wood stands on the site of former moorland. It is a plantation with oak as well as conifers within which there is some wetland. There is scrubby woodland on the banks of the River Tweed below Lochton and Springhill and again just below Birgham Haugh while the aquatic flora of the river is some interest.

The village of Birgham is the only settlement.

Sites with at least moderately good habitat	GR - NT
Newton Don (VC 81 part, also VC 80)	7036, 7037, 7136, 7137
Carham, Tweed opposite (part NT83)	7938, 8038, 8039
Birgham Wood (part NT74, NT84)	7939, 7940, 8040

Habitats

Newton Don has **wooded burnsidess and a park**. Its flora was noted in some detail in the *History* of the Berwickshire Naturalists' Club in 1893 by W Wood with further notes in 1938 by J Brown but there are difficulties in guessing the exact areas botanised by these men and thus in knowing which records related to Berwickshire and which to Roxburghshire. Species that have apparently been lost

from the woods include *Epipactis helleborine*, *Listera ovata* and *Pyrola minor*, just the sort of species that could have been overlooked since.

Potentilla argentea has long been known as a speciality of Stichill Linn and it just survives on the Roxburghshire bank. It is not known for certain whether it ever grew on the Berwickshire bank. The rocks near the linn hold one of the very Berwickshire few populations of *Cystopteris fragilis* on a natural substrate but it is uncertain whether it is native or a well-naturalised introduction. The source of the *Polystichum setiferum* is similarly unclear. The wooded burn-sides still have a varied flora with *Campanula latifolia*, *Chrysosplenium alternifolium*, *Sanicula europaea* and *Senecio aquaticus*. The grassland in the park has a bank with a well-preserved flora including *Opioglossum vulgatum*, *Primula veris* and *Saxifraga granulata*. Nearby, a variety of bluebells has naturalised. It appears that *Hyacinthoides non-scripta*, *H. hispanica* and *H. x massartiana* have all been planted, as more or less discrete patches of each can be found, but there has also been hybridization. The wooded drives and park have an interesting assemblage of introduced species of shaded habitats with *Poa chaixii*, *Luzula luzuloides* and *Carex divulsa* subsp. *leersii*. At least some of the *Poa nemoralis* is also likely to have been sown. *Mycelis muralis* is thought to be an associated introduction.

The **pond** has silted up and is completely dominated by *Glyceria maxima*. First recorded here in 1938, its introduction here has probably helped it spread all too abundantly to many places by the lower Tweed, though it was first recorded for the Tweed below Gainslaw, v.c. 68, in 1904. This is also one of the policies to which *Heracleum mantegazzianum* is thought to have been deliberately introduced, though Riddell, by the Ale Water in Roxburghshire, is generally considered to have been the first point of introduction in the area for that species.

The **walled garden** is home to two *Veronica* species that are weeds of this specialised habitat, *V. peregrina* and *V. polita*.

Birgham Wood is part of a complex of former bogs and sandy moorland, once known as Birgham Muir, that falls in four hectads, but mainly NT73, NT74 and NT84. Only Birgham Wood is described here. The northwest part is mainly conifer plantation but there is a strip on the southwest side with old oaks and some pine, beech and birch. Here there are fine colonies of *Pyrola minor*. The wet woodland tracks are home to a large population of *Mentha arvensis*. The southeast part of the wood is wet and there is some willow carr, however a pond has recently been dug here and some of the best wetland communities have been lost. All the *Carex vesicaria* and half the *Cirsium heterophyllum* have been casualties though a large patch of *Cirsium heterophyllum* remains to the northeast of the pond and to the southwest there is a splendid colony of *Equisetum x litorale* with *Carex riparia* nearby. *Prunus padus* and *Viburnum opulus* have been amongst recent plantings. The lane at the southwest end of the wood has a colony of *Sedum telephium*, but

this is considered to have arisen from garden material dumped there at some time in the past.

On a bank above the **River Tweed** at Lochton there are colonies of *Dianthus deltoides* and *Clinopodium vulgare*. In scrub below is *Lathraea squamaria* with *Carex acuta* at the river's edge. Just upstream there is a thicket of willows by the river. Here, in a glade, there is a small colony of *Poa palustris* on bare alluvium. A little downstream below Springhill *Potamogeton perfoliatus*, *P. x salicifolius* and *Ranunculus x kelchoensis* have been found in the river. The wood downstream of Birgham Haugh has large specimens of *Prunus padus*, but these appear to have been introduced. There are also wet seepages with *Eupatorium cannabinum*, the upstream limit for this species. A **limestone outcrop** at the hectad boundary has *Rosa rubiginosa* and *Rubus caesius* with, in NT83 only, *Cerastium arvense*, *Echium vulgare* and *Galium boreale*. *Allium carinatum* has recently colonised on riverside rocks nearby. *A. vineale* may also be a relatively recent colonist. *Rosa rubiginosa* may well be native. The limestone is best exposed for 100m at the 10km square boundary. *Stellaria neglecta* occurs by the river but may be an introduction. *Ranunculus fluitans* is in the river nearby.

A **grass bank** between Birgham Haugh and the village has *Geranium pusillum* with *Medicago arabica* as a naturalised introduction, perhaps derived from plants that occurred as wool aliens by the river, though this species can also be introduced when lime is spread on fields. These fields have a fine population of *Ranunculus bulbosus*.

The lane below the **village** of Birgham has colonies of *Ballota nigra*, *Malva neglecta*, *Silybum marianum* and *Symphytum orientale*. *Buddleja davidii* has recently naturalised away from the houses.

Chrysanthemum segetum was seen as an **arable weed** near Newton Don in 1981 but has not been found since except where sown in Birgham. *Persicaria lapathifolium* grows in a damp field corner near the pond that now marks the site of the former Lochton or Crawboat Loch. *Amsinkia micrantha* and *Anisantha diandra* at Harrietfield are recent colonists.

NT74 Greenlaw

(Systematic sample surveys 1998, 2013)

Overview

99% of the hectad NT74 is in Berwickshire. It lies between 82m by the Blackadder Water below Bogend and 285m at Kyles Hill.

Marchmont, much of Greenlaw Moor, Greenlaw and a strip south towards Hume lie on the upper Old Red Sandstone, while Eccles, Leitholm and Charterhall lie on the Carboniferous sandstones. Intrusive rocks outcrop at Kyles Hill, around Hume and near Lintmill Bridge.

A great deal of the hectad is productive arable land with very little botanical interest. Greenlaw Moor is much the largest block of semi-natural habitat. The Marchmont estate nearby has a wide variety of habitats in small parcels, some associated with the Howe Burn. The Blackadder Water is the principal river and although it becomes eutrophic below Greenlaw it has some modestly interesting botanical habitats along its banks. The former moorland and wetland at Birgham Moor is largely lost, leaving Birgham Wood and the partly-drained wetlands of Bishop's Bog and Horse Bog. The intrusive rocks of the Kelso Traps provide the best grassland habitats in the hectad at Hume Mill, Hume Castle, Hume Craigs and Lintmill Bridge.

The town of Greenlaw is the main settlement, with villages at Eccles and Leitholm.

The disused railway from Greenlaw to Duns follows the Blackadder Water and the Howe Burn.

Sites with at least moderately good habitat	GR - NT
Hume Mill	7040
Hume Castle	7041
Hume Craigs (part NT64)	6941, 7041
Rumbleton Burn (see NT64)	7045
Greenlaw Dean (see NT64)	7046
Greenlaw Moor (part): Flourishwalls Burn, Hule Moss, tributaries of Fangrist Burn	7049, 7148, 7149, 7248, 7249
Lintmill Bridge	7246, 7346, 7446, 7447
Marchmont	7347, 7447, 7448, 7449, 7549
Sisterpath	7547, 7548, 7648
Bishop's Bog (Fernyrig Bog)	7840
Birgham Wood (see NT73)	7940
Horse Bog	7940

Habitats

Greenlaw Moor harbours an important winter goose roost at Hule Moss but is profoundly dispiriting to the botanist, especially the section in this hectad. The formerly fine flush at the head of the Flourishwalls Burn was damaged by drainage a number of years ago, a breach of the SSSI regulations. Although *Blysmus compressus*, *Dactylorhiza incarnata*, *Sagina nodosa* and *Selaginella selaginoides* survive there for the present, their numbers are reduced and their future is uncertain. Only a small section of the rich burnside communities by the Fangrist Burn and its tributaries fall in the hectad. Here there is *Berula erecta* with *Blysmus compressus* and *Selaginella selaginoides*. Hule Moss itself is a eutrophic reservoir and the more natural moss to the east with *Lythrum portula* is just a small feature. The rest of the moor is over-managed grouse moor where the temporary reappearance of *Genista anglica* in 2002 and *Platanthera bifolia* in 2000 are but poignant reminders of what might have been. Across the A6105, Woodheads Strip and Blaeberry Plantation lie on former moorland and there is some *Vaccinium myrtillus* with *Pyrola minor*, which is favoured rather than hindered by the shade of the old beeches in the strip. Fragments of former moorland are preserved within Charterhall Wood.

At **Marchmont**, to the south, the mansion lies on a ridge between the Swardon Burn and the Howe Burn, giving the setting for the fine avenue that runs two kilometres northeast from the house. The geology is complex, and weak sections of rock have been gouged out by Ice Age glaciers leaving a marvellously sculpted landscape that has been adapted to inspiring parkland on a very large scale. There

are woodland and wetland habitats by the burns with *Allium ursinum*, *Carex paniculata*, *Equisetum sylvaticum*, *Hypericum hirsutum*, *Valeriana dioica* and *V. officinalis*. Lounds Dale has surprisingly large colonies of *Adoxa moschatellina* and *Chrysosplenium alternifolium* but *Allium paradoxum* has now begun to colonise this burnside habitat. The walled vegetable garden was in cultivation with a varied weed flora when visited in 1998 but this is no longer the case. A charophyte, *Chara globularis/virgata* agg., was plentiful in a pond in 1998. This pond has now been colonised by *Elodea nuttallii*.

The **Blackadder Water** is now too eutrophic for most aquatic species and *Ranunculus circinatus* was last seen there in 1973. However an enigmatic hybrid clone of *Ranunculus* is still quite frequent whose parents have been repeatedly suggested to be *R. circinatus* and *R. fluitans*. No molecular studies have been made to confirm this. This clone is not known elsewhere in Britain or further afield. The riversides near Sisterpath are moderately rich with *Agrimonia eupatoria*, *Berula erecta*, *Carex paniculata*, *Chrysosplenium alternifolium* and *Saxifraga granulata*. Similar communities are found above and below Lintmill Bridge. *Campanula latifolia* is present near Fogo. Here *Sparganium emersum* is also recorded, but there is some doubt about the record which has not been refound. *Butomus umbellatus* has now become frequent by the Blackadder. *Darmera peltata* has naturalised above Cairns Mill, growing as an emergent aquatic on the bed of the river.

There is a complex of modified habitats that marks the former **Birgham Moor** with Birgham Wood the most interesting. This is described under hectad NT73. Bishop's Bog still has large stands of *Phragmites australis* with *Carex riparia*, *Salix pentandra* and *Solanum dulcamara* while Horse Bog also has *Carex riparia*. Crown Gorse is plantation with much *Betula pendula* which is possibly native there, unusually for Berwickshire.

The knowes in a small meadow at Hume Mill had an excellent **grassland** community but this has now been largely lost to whins and a pig paddock. *Ranunculus bulbosus* is still quite plentiful. *Dianthus deltoides* was accompanied by *Helianthemum chamaecistus*, *Koeleria macrantha*, *Myosotis ramosissima*, *Saxifraga granulata*, *Scleranthus annuus*, *Trifolium striatum* and *Vicia lathyroides* with *Iris pseudacorus* by the burn. The building of Hume Castle modified the eminence on which it stands, but *Malva neglecta* has long been naturalised there and small populations of *Geranium pusillum*, *Saxifraga granulata* and *Stellaria pallida* survive, but *Vicia lathyroides* appears to have been lost recently. To the north of the houses, Hume Craigs have similar communities in small quantity. Most of the craigs are acid, with *Montia fontana* subsp. *chondrosperma* and *Stellaria pallida* much more widespread than *Sherardia arvensis*, *Trifolium striatum* and *Vicia lathyroides*. *Viola lutea* and *V. tricolor* are also present.

Catabrosa aquatica occurs in a spring. A further outcrop of the Kelso traps is to be seen in the railway cutting near Lintmill Bridge and on a knoll to the south of the Blackadder nearby. This is now the only known station in Berwickshire for *Plantago media* as a native. Other notable species are *Anthyllis vulneraria*, *Cerastium semidecandrum*, *Dianthus deltoides*, *Knautia arvensis*, *Silene vulgaris* and *Trifolium arvense*.

Other **wetland** habitats are few. The wetland by the Rumbleton Burn is described under hectad NT64. A pond by the farm at Greenlawdean was a station for *Potamogeton obtusifolius* in 1998, but this species was not refound in 2013. *Senecio aquaticus* occurs by the Lambden Burn. The pond at Rowchester House has an elaborate Japanese-style bridge with a splendid specimen of *Platanus orientalis* nearby but is not otherwise of botanical interest. Eccles Pools are believed to have a post-glacial origin as kettlehole lakes, but this is hardly evident today though *Carex riparia* and *C. vesicaria* are present.

There are some farmhouses and mansions with **policies** of interest. At Hassington there was formerly fairly pristine habitat in small elm wood where *Tulipa sylvestris* and an attractive pale form of *Primula vulgaris* are naturalised. However the wych elms have largely succumbed to Dutch elm disease and *Allium paradoxum* has invaded. The immediate policies at Charterhall have not been botanised but those at Anton's Hill have *Listera ovata* and *Primula veris*. *Milium effusum* is probably an introduction as it is associated with *Luzula luzuloides*. However *Allium ursinum* is plentiful alongside, a rather surprising occurrence for a species that tends to specialise in burn-sides in Berwickshire, so there is some evidence of woodland history here.

The **arable weeds** of the hectad are in decline. However several colonies of *Anagallis arvensis* and *Viola tricolor* were found in 2013 and *Lamium amplexicaule*, *L. confertum* and *L. hybridum* are occasional. *Sinapis alba* is one of the species sown as game crops and may persist. Other sowings include *Chenopodium quinoa*, *Cichorium intybus* and *X Triticosecale*.

Ruderal habitats are modest. There is a long-established colony of *Polygonatum multiflorum* in a species-rich roadside near Eccles. In the village itself *Erinus alpinus* is well naturalised on walls. *Lactuca virosa* occurred as a casual by Puncheon Bridge in 1999, the only recent record away from its usual haunts on cliffs and banks near the River Tweed. Charterhall Airfield has a great abundance of a red-leaved variety of *Sedum album* on the old runways accompanied by *Vulpia bromoides* and, more surprisingly, by *Rumex longifolius*. The usual halophytes have colonised the major roads.

NT75 Duns

(Systematic sample surveys 1990, 2008)

Overview

All of the hectad NT75 is in Berwickshire. It lies between 75m on the Whiteadder Water below Cumledge and 360m at Hardens Hill.

This is a geologically diverse hectad. While the Upper Old Red Sandstone underlies the larger part of the hectad, there are acid Silurian rocks to the northwest towards Ellemford Bridge and Carboniferous sandstones to the east below Preston on the Whiteadder Water and between Gavinton and Nisbet Hill to the southeast. Intrusive rocks form prominent features at Harelaw Craigs, with its recently-closed road-stone quarry, at Cockburn Law continuing across the Whiteadder to Stoneshiel Hill, at Kyles Hill by Greenlaw Moor and most notably at Dirrington Great Law.

The botanical interest reflects this geological diversity. Nevertheless the habitats are mainly fragmented or, in the case of moorland, much degraded. The moorland, generally species-poor, contains pockets with unexpectedly rich communities. Of considerable local interest are the modest woodland remnants, along the Langton Burn, a few of the other burns and the Whiteadder. Further botanical interest is found in the policies of Duns Castle, most of which are generously made open to the public.

Although Duns is the county town of Berwickshire there is little industrial activity and the ruderal habitats around the town are limited, while the spoil heaps at Harelaw Craigs quarry have modest interest only. Given the variety of soils, the scarcer arable weeds are surprisingly weakly represented.

Sites with at least moderately good habitat	GR - NT
Greenlaw Kaims and burns, east section (see NT65)	7050, 7051
Crook Burn, Dyeshaugh, east section (see NT65)	7058
Dirrington Great Law, east section (see NT65)	7054, 7055
Langtonlees	7352, 7353, 7452, 7552, 7553
Hells Cleugh	7354, 7355, 7454, 7455
Duns Castle	7754, 7755, 7854, 7855
Cockburn Mill	7658, 7757, 7758, 7759
Preston Bridge	7856
Hoardweel	7859, 7959

Habitats

Moorland habitats include part of Greenlaw Moor. The moor itself is burnt with obsessive rigour and has lost almost all its diversity. The only redeeming feature is Polwarth Moss which has what is probably the largest colony of *Salix repens* in Berwickshire. However the area to the west of the Greenlaw Kaims at Cleckinshaw is a network of burns and flushes at the site of a former glacial lake with *Blysmus compressus* by the Fangrist Burn (an outlier of the main colonies downstream) and *Carex dioica*, *Dactylorhiza incarnata*, *Eleocharis quinqueflora*, *Euphrasia scottica*, *Sagina nodosa*, and *Selaginella selaginoides* in the flushes where *Parnassia palustris* is rather fine. The burns have *Berula erecta*, *Ranunculus trichophyllus* and *Veronica x lackschewitzii*. To the north of Bedshiel there is a colony of *Cirsium heterophyllum* by the Kettleshiel Burn.

At the foot of Dirrington Great Law there are springs beside the burn at Dronshiel. Here *Apium inundatum* still prospers at the spring-head with the charophyte *Chara globularis/virgata* agg. but other species, including *Sedum villosum*, have been lost to drainage. The hill itself, of which only part is in the hectad, has an extensive colony of *Vaccinium vitis-idaea*. Hardens Hill and Langton Edge have lost their moorland to forestry but *Lycopodium clavatum* occurs by the tracks. Just to the north an area of good moorland does survive. This is grazed by sheep and cattle and had a much more diverse flora than Greenlaw Moor but suffered an unfortunate fire in 2007. *Empetrum nigrum* was particularly plentiful. Below the moor there are a series of deep cleughs through the Old Red Sandstone conglomerate. Here at Hells Cleugh, Cat Cleugh, Rams Cleugh and by the White Burn are a very fine series of flushes with abundant *Pinguicula vulgaris* and frequent *Parnassia palustris*. *Carex dioica* and *Selaginella selaginoides* are quite

well represented with *Euphrasia scottica* and a very little *Eriophorum latifolium* and *Narthecium ossifragum*. Similar habitat occurs by the Back Burn above The Hardens, but its extent and diversity are much more modest.

Hen Toe Bog is drained and planted with conifers but *Lycopodium clavatum* and a single plant of *Diphasiastrum alpinum* have colonised the tracksides. Cockburn Law has but limited heather and no species of individual interest are known there. The former moorland east from Stoneshiel Hill along Bunkle Edge is all ploughed or planted.

Wetland habitats other than the moorland flushes and the riversides are few. Part of the *Trollius europaeus* site at Crook Burn, Dyshaugh, falls in the hectad and there is modest interest by the Howe Burn with *Berula erecta* and *Solanum dulcamara*. The Hen Poo at Duns Castle is an artificial lake on a former wetland site where the main species of interest may all be introductions. These include *Acorus calamus*, *Nuphar lutea*, *Ranunculus lingua*, *Schoenoplectus lacustris*, *Typha angustifolia* and *T. latifolia*. The pondweeds are inadequately surveyed, as the water's edge is treacherous with a floating mat of vegetation where *Menyanthes trifoliata* and *Potentilla palustris* flourish.

First and foremost among the **woodland** and riverside sites are Langtonlees Cleugh and the woodlands down the Langton Burn to Gavinton. At Langtonlees there has been much habitat loss over the years and the moorland, grassland and extensive flush system are all but destroyed with *Carex pallescens* up the Wellcleugh Burn almost the only locally scarce species that may survive, though it could not be refound in 2008. The cleugh itself is still delightful but it is just a narrow strip in a deep gorge. The birch, oak, ash and elm are accompanied by *Populus tremula* and *Prunus padus* and a wide range of herbaceous plants including *Cirsium heterophyllum*, *Gymnocarpion dryopteris*, *Melica uniflora* and *Rubus saxatilis*. However it is the commoner species like *Allium ursinum*, *Anemone nemorosa*, *Geranium sylvaticum*, *Mercurialis perennis* and *Primula vulgaris* present in a varied succession of micro-habitats that gives the cleugh its character. The woodlands lower down the burn are considerably modified but retain areas with a good ground flora. *Carex remota* is occasional while *Campanula latifolia*, *Chrysosplenium alternifolium*, *Equisetum sylvaticum* and *Polystichum aculeatum* are more frequent. *Doronicum pardalianches* is invasive downstream of the ruins of Langton House. The same type of woodland, though more modified, occurs below Gavinton.

Duns Castle has extensive woodland that has been managed in small blocks for many years and is much more varied than most plantations. The Oxendean Burn has carpets of *Allium ursinum* though the *Ulmus glabra* once associated with it is much reduced. Elsewhere in the woods several colonies of *Pyrola minor* are

found. It occurs most typically under beech, but one colony is just under a bench seat by a woodland walk and another on a series of steps along the walkway. *Geranium sylvaticum* is widespread but *Equisetum sylvaticum* is scarce while *Milium effusum* and *Poa chaixii* are naturalised introductions. The *Carex sylvatica* found with these two grasses and elsewhere could be native or introduced or both.

There are a series of woodland fragments by the Whiteadder Water. At Hoardweel there is extensive juniper scrub but the former moorland-edge setting has been lost so, although the bushes themselves are impressive, the habitat as a whole is not. There are grasslands of interest along the Whiteadder nearby, especially on the rocks at the Devil's Dungeon. Good woodland occurs near the river between Cockburn and Cockburn Mill Ford. A small dean at Cockburn has abundant *Hyacinthoides non-scripta* while the riverside has *Campanula latifolia*, *Chrysosplenium alternifolium*, *Geranium sylvaticum*, *Prunus padus*, *Saxifraga granulata*, *Solidago virgaurea* and *Stellaria nemorum*. The slopes of Stoneshiel Hill are bracken dominated with woodland remnants and present a woodland restoration opportunity. Similar fragments are found at Almaheart and near Preston Bridge. At Cumledge the soils change to the Carboniferous and *Elymus caninus* is remarkably plentiful but otherwise the flora is similar. The *Malva moschata* on the river gravels at Cumledge is probably an introduction. *Doronicum pardalianches* is invasive along all the banks of the Whiteadder that fall in the hectad often with *Claytonia sibirica* and *Symphytum tuberosum*. *Myrrhis odorata* is quite frequent in woodland and riverside habitats.

Only a short stretch of the Blackadder at Nisbet Hill falls in the hectad. Here the **aquatic** hybrid *Ranunculus circinatus* x *fluitans* occurs with *Berula erecta* and the naturalised *Butomus umbellatus*.

Grassland habitats away from the moorland edges are just fragments by the riverside and road verges. *Helianthemum nummularium* is occasional on knowes by the Whiteadder while *Knautia arvensis* is known only on a road verge near Peelrig. There is a colony of *Viola lutea* at the hill fort at Raecleugh Hill Head, all with the yellow flowers usual in Berwickshire.

Given the variety of soils, **arable weeds** are weakly represented. *Galeopsis speciosa* and *Lamium amplexicaule* are scarce while *Lamium confertum* is more widespread.

Ruderal habitats around the town of Duns support *Aethusa cynapium* and *Fumaria officinalis* subsp. *wirtgenii*. Gavinton boasts *Montia fontana* subsp. *chondrosperma* on the path to the church and *Veronica agrestis* and *V. polita* in gardens. Of the neophytes *Allium paradoxum* is now widespread around Duns and by the Whiteadder below Preston, *Pseudofumaria lutea* is long-established on

walls at Duns and has recently been joined there by *Buddleja davidii*. *Reseda luteola* is plentiful in Harelaw Craigs quarry.

Recent **game crops** have included *Melilotus alba* and *M. officinalis* near Grueldykes.

The **roadsides** have the usual halophytes, *Atriplex prostrata*, *Puccinellia distans* and *Spergularia marina*, and also *Juncus ambiguus* with *Sagina maritima* along the B6456 near Bedshiel.

NT76 Abbey St Bathans

(Systematic sample surveys 1995, 2010)

Overview

79% of the hectad NT76 is in Berwickshire. It lies between 45m at the burn below Pease Bridge and 365m on the slopes of Heart Law.

Most of the hectad lies above 150m on acid Silurian rocks but these meet deposits of the Upper Old Red Sandstone at the Heriot Water and Tower Dean in the north and marginally near Ellemford Bridge. There is a small area of sand from post-glacial deposits between Stockbridge and Cockburnspath.

This is not a species-rich hectad and the botanical interest has been depleted by the loss of almost all the moorland to improved grassland and conifer forestry, some of it but recently. However enough remains of the oakwoods around Abbey St Bathans to leave an attractive entity that offers excellent displays of woodland flowers in the spring. Even better oakwoods were formerly present at Penmanshiel, but most of this wood is now planted with conifers. However the lower part is dean woodland of quite high botanical interest.

The small settlement at Abbey St Bathans boasts a church. There is very little arable ground.

Sites with at least moderately good habitat	GR – NT
Blackford Rig, Philip Burn	7063, 7163
Little Dod, Eye Water below	7366
Hoprigshiels Wood	7468
Frampath Burn	7461
Ellerburn Wood	7660, 7661
Crooked Bank, Laughing Law	7264, 7363, 7364
Brush Wood, Godscroft Wood	7363, 7463
Bankend Wood	7462, 7562
Shannabank Wood	7562, 7661, 7662
Butterwell Wood	7661, 7761
Retreat Wood	7760
Wild Wood	7760
Elba Wood	7860
Aikyside Wood	7860, 7960, 7961
Ecclaw Hill	7567
Edmond's Dean, Bowshiel Dean	7667, 7767, 7768, 7866, 7867, 7967
Pease Dean, upper section, Penmanshiel Wood (part NT86)	7966, 7967, 7968, 7969, 8068
Tower Dean, upper section	7769, 7869

Habitats

The **woodlands** are the main botanical feature. Following the Whiteadder down from Ellemford Bridge there is only fragmentary interest in Roughside Wood, Greenhope Wood and Scrogie Wood but the Frampath Burn is an attractive cleugh, albeit no longer set in moorland, with *Gymnocarpion dryopteris*. The screes at Mountjoy Wood have, rather surprisingly, lost *Cryptogamma crispa* but there is much *Ceratocarpus clavicaulata* which is something of a feature of the area.

Just above Abbey St Bathans the Monynut Water joins the Whiteadder Water. While the source of the Monynut Water is in East Lothian, it flows into the vice-county of Berwickshire at Nether Monynut below which there are a series of good oakwoods on the east bank. The oaks themselves have not been exhaustively studied but it appears that not all the native oaks are *Quercus petraea* as there are signs of introgression with *Quercus robur*. The latter is also present, but probably mainly as plantings. Crooked Bank and Laughing Law are largely scrub and grassland with some good colonies of *Helianthemum nummularium*. Brush Wood is somewhere between an oakwood and wood pasture and here the primroses and anemones are particularly impressive with *Geranium sylvaticum* and *Prunus padus* by the burn. The woodland cover is more complete at Godscroft Wood and

Bankend Wood where *Solidago virgaurea* becomes a feature on rocks near the burn. *Prunus padus* remains prominent along the waterside for some kilometres by the Monynut and Whiteadder Waters.

Below the junction of the two waters, Shannabank Wood has good habitat, especially along the White Burn as the section opposite Abbey St Bathans House is compromised by amenity plantings though *Adoxa moschatellina* and *Chrysosplenium alternifolium* are evidence of less acid conditions. *Meconopsis cambrica* and *Sambucus racemosa* have naturalised quite widely. Butterwell Wood has the only colony of *Lathraea squamaria* ever recorded anywhere on the Whiteadder, which is strange, as apparently suitable habitat is widespread. *Ranunculus auricomus* is also present, but in small quantity. This species is surprisingly scarce in Berwickshire as a whole. Below Retreat House there is a bend in the river with fine habitat on both banks and on islets in the river. Retreat Wood still has a fair colony of *Melampyrum pratense* which has quite recently disappeared from all the other woods in the series, apparently as a result of eutrophication, with grasses becoming more dominant. The islets support the only colony of *Salix myrsinifolia* in Berwickshire (one bush may survive near Grantshouse). *Populus tremula* grows nearby. Across the river, Wild Wood is much wetter and quite a wide riverside strip is dominated by alder. Here *Cardamine amara*, *Carex laevigata* and *C. remota* are found with *Phegopteris connectilis* and *Viburnum opulus* on the bank above. *Hyacinthoides non-scripta* is locally dominant but the *Symphytum tuberosum* at the waterside is considered to be a naturalised introduction along with *Claytonia sibirica* and some more intrusive neophytes. Below this, an attractive stretch of rocky riverside leads to Elba, where Strait Leap is the name given to a gorge at the bend in the river. *Populus tremula* grows on the rocks with a good colony of *Ranunculus auricomus* above in which the flowers are mostly perfect, rather than with the reduced number of petals so often seen. There are a few native junipers in the oaks above and more have recently been planted.

At some distance from the Whiteadder lies Aikyside Wood, a uniformly acid oakwood. There is flushed grassland alongside with a large colony of *Carex laevigata* and traces of the moorland now lost from the slopes adjacent. However a colony of over three hundred large junipers survives. A photograph taken in 1960 shows these to have been truly magnificent, but they are now ageing and the habitat has deteriorated sadly with the spread of bracken and brambles. Pigs were recently turned out in the wood in an attempt to promote regeneration. This did not happen. Instead rank vegetation invaded, especially amongst the junipers. Although planted with conifers, large colonies of *Gymnocarpium dryopteris* and *Phegopteris connectilis* survive at Ellerburn Wood on steep, wet, north-facing slopes.

There was formerly good woodland habitat in the upper part of the Pease Burn watershed at Blackburnrig, Edmond's and Bowshiel Deans. Very little undisturbed habitat remains there. *Gymnocarpion dryopteris* just survives in Blackburnrig Dean and in one of the side cleughs at Bowshiel Dean where it grows with *Melica uniflora*. Although Bowshiel Dean does have some small stands of old oaks and a few heathery banks, the wet burnside is arguably as interesting with *Callitriche hamulata*, *Senecio aquaticus* and *Veronica scutellata*. The charophyte *Nitella flexilis/opaca* agg. is found in a pond.

Penmanshiel Wood was one of the Berwickshire sites most visited by nineteenth century botanists but much the greater part of the oakwood and all the adjacent moorland have been lost. The side cleughs have a little remnant oakwood and here *Milium effusum* was recorded in 1989. *Chrysosplenium alternifolium* is frequent near the burn with *Ceratocarpus clavicaulata* above. The banks of the railway cutting have a large colony of *Ulex gallii* but this is associated with *Cytisus multiflorus*, so the *Ulex* may also be an introduction especially as it was not found by the nineteenth century botanists, despite it being known to them elsewhere. Only the upper part of Pease Dean is in the hectad. It is contiguous with Penmanshiel Wood but is marked by the point where the burn drops abruptly into a gorge. The gorge is mixed woodland of oak, ash and elm and is notable for a large colony of *Polystichum setiferum* which is thought to have extended recently away from the most sheltered recesses. Similarly, only the upper part of Tower Dean is in the hectad. This is much the most natural part with good oakwood and is again notable for *Polystichum setiferum*. *P. aculeatum* is surprisingly scarce. The upper part of the Tower Burn is known as the Heriot Water. Its banks have a good deal of alder and occasional flushes with remnants of a moorland flora including such species as *Carex pulicaris* and *C. viridula* subsp. *brachyrrhyncha*. Hoprigshiels Wood is a more notable stand of alder with a characteristic ground flora including *Ajuga reptans*, *Cardamine amara*, *Iris pseudacorus* and *Lysimachia nemorum*.

The conifer plantations at Catch Hill, Dunter Law and Dunglass Common occupy **former moorland** and are now most notable for the clubmosses *Diphasiastrum alpinum* and *Lycopodium clavatum* together with *Euphrasia micrantha*, all three being found on stony tracksides. Small moorland fragments survive nearby. An unexpected survival is *Genista anglica* at Ecclaw Hill in a small area of heather with acidic flush communities. At Blackford Rig there are **base-rich flushes** with *Eleocharis quinqueflora*, *Euphrasia scottica*, *Pedicularis palustris* and *Pinguicula vulgaris* in a partly drained field and another flushed burnside above the Dye Water below Little Dod has similar species over a wider area joined by *Dactylorhiza incarnata* subsp. *incarnata*, *Selaginella selaginoides* and *Narthecium ossifragum*. A comparable small area of wetland survives by Hen Toe Bridge with *Parnassia palustris* and *Pedicularis palustris*, though the *Parnassia* was not refound in 2010.

Apart from these flushes there is little **wetland**. Bits and pieces of wetland near the Eye Water at Quixwood Moor still yield *Menyanthes trifoliata* with *Oreopteris limbosperma* on the banks nearby.

There is next to no natural **grassland** away from the burnside with any degree of species-richness. At Edin's Hall above the Wild Wood *Carex caryophylla* and *Stellaria pallida* are present in grassland near the remains of the broch. At Glen Fin there are sandy knowes with tiny populations of *Erodium cicutarium* and *Spergularia rubra*.

There are a few **arable** fields on sandy ground between Tower Bridge and Stockbridge. Here *Anagallis arvensis*, *Lamium amplexicaule*, *L. confertum* and *L. hybridum* occur with *Amsinckia micrantha* as a recent arrival.

A wildflower mix has been sown recently where the Cockburnspath bypass on the A1 passes through a rock cutting. Only part of the cutting is in the hectad. Here *Galium mollugo* and *Stachys officinalis* have naturalised well. The usual roadside halophytes occur on the A1 and *Atriplex littoralis* has colonised the A6112 near Drakemire.

NT77 Cockburnspath

(Systematic sample surveys 1990, 2009)

Overview

Only 8% of the coastal hectad NT77 is land that falls in Berwickshire. It lies between sea level and 140m near Hoprig. This is an interesting area with a distinct geology. It lies on the Upper Old Red Sandstone and Carboniferous Sandstones, partly overlaid by fluvio-glacial sand and gravel. The farmland is cut by dramatic deans and the coast is varied with sandy bays, shingle, cliffs and sea braes. Pease Bay has a caravan development and Cove a small picturesque harbour. Cockburnspath itself is a village of character close to the A1 trunk road and the mainline railway. Sand and gravel are extracted nearby.

Sites with at least moderately good habitat	GR - NT
Dunglass Dean (VC 81 part, also VC 82)	7570, 7571, 7671, 7772
Ramsheugh Bay, Reed Point	7772
Cove, Cove Harbour	7871
Pease Dean, lower section, Tower Dean, lower section	7870, 7970
Pease Bay, Ewelairs	7871, 7970

Habitats

At Dunglass Dean, of which only the south side is in Berwickshire, the hill burn drops into a modest dean that deepens swiftly to a dramatic sandstone gorge. The **dean woodland** is much modified by plantings except in the gorge which is remarkable for a profusion of ferns. However there is little species diversity: while there is abundant *Phyllitis scolopendrium*, *Polystichum aculeatum* and *P. setiferum* are notably rare. This has historically been one of just two significant stations for *Carex pendula*, though this species is now establishing in a few other places from introductions. Well-naturalised *Fuchsia magellanica* is an unexpected feature of the dean. Pease and Tower Deans are two further dean woodlands that join near their foot. Only part of the deans falls in the hectad. Despite the intrusion of a road crossing, Pease Dean has the more natural woodland of oak, ash and elm. Tower Dean has suffered partial conversion to conifers but is now being restored by the Scottish Wildlife Trust and here *Polystichum setiferum* now has much its best station in Berwickshire, as what was always a good colony has spread dramatically out of the confines of the gorge onto the wooded banks, possibly assisted by climate change. *P. aculeatum* is also well-represented and the hybrid occurs. The woodland ground flora is quite varied in both deans. *Adoxa moschatellina*, *Cardamine amara*, *Chrysosplenium alternifolium* and *Veronica montana* are well represented. *Campanula latifolia* and *Equisetum telmateia* are present. *Allium paradoxum* in Pease Dean and *Impatiens glandulifera* in Tower Dean are recent intrusive incomers.

The **sea braes** are now all un-grazed and there is much rank grassland. The modest areas of shorter turf are associated with cliff-edges and their area seems to have been reduced by eutrophication from the fields above. They remain attractive with *Armeria maritima*, *Leontodon hispidus*, *Ononis repens* and *Plantago maritima*. *Astragalus danicus* was not refound in 2009, but there is a little *Centaureum erythraea* near Cove. Coastal heath is represented only by patches of *Calluna* at Hawk's Heugh. There are some flushes with *Dactylorhiza purpurella*, *Carex flacca* and *Succisa pratensis* with a very little *Carex pulicaris*, others are

carpeted by tall herbs with large patches of *Eupatorium cannabinum*. *Populus tremula* occurs on cliffs by Cove Harbour and *Asplenium marinum* a little to the south. The braes continue inland at the foot of Tower Dean and here, beyond the caravans, the sandy grassland was grazed until relatively recently and supported modest populations of *Erodium cicutarium*, *Filago minima*, *F. vulgaris*, *Myosotis ramosissima* and *Sherardia arvensis*. These populations have now been lost to coarse grasses and whins except at the very edge of the escarpment.

The **seashore** is interesting with a diversity of communities, albeit often in small quantity. The sand at Pease Bay has recently been re-colonised by *Cakile maritima* in some quantity and there are modest dunes with *Ammophila arenaria*, *Leymus arenarius* and *Elytrigia juncea*. One plant of *Beta maritima* ssp. *maritima* was seen in shingle at the back of the north part of the bay in 2009 and *Salsola kali* has occurred as a casual in the past. The two bays at Ramsheugh have more shingle than sand and there are fragments of saltmarsh among the rocks. *Glaucium flavum* is plentiful on the shingle, except where *Centranthus ruber* has colonised, and the saltmarsh has *Blysmus rufus*, *Carex extensa* and *Spergularia media*. One plant of *Aster tripolium* has recently established and *Suaeda maritima* and *Parapholis strigosa* have both occurred transitorily in the past. *Seriphidium maritimum* likewise appears to be somewhat transitory, being currently known only at a headland south of Cove Harbour. *Vicia lathyroides* is not prospering with only single plants being recently seen or suspected in sand at Ramsheugh and Cove Harbour. *Valerianella locusta* fares little better in the same habitat.

The fields are sandy enough to support a diverse **arable weed** flora, but there is little suitable cropping and the scarcer species are mostly encountered around Cockburnspath itself or on the sand and gravel workings. Species present include *Chrysanthemum segetum*, *Fumaria capreolata*, *F. densiflora* and *F. purpurea*. Sandy banks at Cockburnspath also support a **neutral grassland** flora with *Chenopodium bonus-henricus*, *Geranium pusillum*, *Malva neglecta* and *Silene vulgaris*. *Agrimonia eupatoria* occurs in just a few places at field boundaries while *Vicia sativa* subsp. *segetalis* is more widespread and perhaps an introduction.

The A1 trunk road now bypasses Cockburnspath through a rock cutting. Here the **roadside** banks have been sown with a wildflower mix and species established include *Campanula trachelium*, *Cytisus striatus*, *Galium mollugo* and *Stachys officinalis*.

NT83 Coldstream

((Systematic sample surveys 1997, 2010)

Overview

Only 5% of the hectad NT83 is in Berwickshire. It lies between 8m on the Tweed at Coldstream and 52m at Homebank. The geology is calciferous sandstones of the Carboniferous overlain with glacial drift. This is good agricultural land, indeed Lees Haugh is the best in the county.

The river Tweed is the dominant feature and there are some fragments of natural grassland by the riverside. The aquatic flora of the river has survived to a remarkable extent. The Leet Water is also a feature.

The Hirsle Estate has woodlands that relate back to earlier more natural habitat as well as grassland and wetland. Coldstream Golf Course lies on this estate by the Leet Water.

The town of Coldstream is prominent.

Sites with at least moderately good habitat	GR - NT
Carham, Tweed opposite (see NT73)	8038, 8039
Fireburnmill, Tweed near	8139, 8238, 8239, 8338, 8339

Habitats

The **Leet Water** is a **wildlife corridor** across the heart of the agricultural land of the Merse with grassland, wetland and fragmentary woodland. This corridor continues through to its junction with the Tweed. Below The Hirsle *Rumex conglomeratus* occurs at the river margin near *Schoenoplectus lacustris*, while a haugh area supports *Festuca pratensis* and *X Festulolium loliaceum* with a little *Agrimonia eupatoria*. The woodland has *Brachypodium sylvaticum* and *Hypericum hirsutum* and a little *Mycelis muralis*. While this is a natural habitat for the *Mycelis*, the plants are probably just outliers of the large populations on walls in Coldstream and at The Hirsle and it is perhaps best considered as an introduction, as elsewhere in Berwickshire.

Away from the Leet Water **species-rich grassland** is almost confined to the banks of the Tweed. *Rosa rubiginosa* occurs at a species-rich road verge by the A697 at Fireburnmill and by the Leet Water. It may well be native. Below Fireburnmill there is a river wall built of limestone which had *Galium boreale* in 1997. The top of the wall has since been colonised by dense scrub. A small part was reached

from the river in 2013. The riverside here boasts *Ononis repens* and *Origanum vulgare* but *Plantago media* was last recorded in 1960, though there is an intriguing record of this species from 1987 at the southwest corner of Dundock Wood. *Knautia arvensis* is occasional on the riverside banks while *Silene vulgaris* is found by the A697. At the Lees there is another interesting riverside retaining wall. Here it is not so much the wall itself but a steep bank immediately above it that is species-rich. The *Cerastium arvense*, *Myosotis ramosissima*, *Trifolium striatum* and *Valerianella locusta* that occur here are probably relicts of former sandy grassland. *Galium mollugo* is still found by the drive to The Hirsell, but recent grassland management has severely reduced it.

Amongst the introductions at the **riverside** *Heracleum mantegazzianum* has been extensively controlled but is far from eradicated. The colourful *Impatiens glandulifera* is popular with the fishing community, which is a mercy as it appears uncontrollable, while *Scrophularia umbrosa* is long-naturalised. *Crambe hispanica* escaped in quantity when a crop at Lees Haugh flooded in 2005 and flowered plentifully where silt was deposited but has barely persisted whereas *Poa palustris* appears to have persisted unnoticed there for a century or more at muddy river margins, but in very small quantity. *Myosoton aquaticum* and *Rorippa x anceps* appear to be recent arrivals at Lees Haugh.

The River Tweed **aquatic species** are well represented in the hectad: *Potamogeton lucens*, *P. x salicifolius*, *P. pectinatus* and *P. perfoliatus* form the core of the pondweed community that is well developed where the river runs over rock shelves by Fireburnmill but less so in the more sluggish section at Lees Haugh. *Potamogeton pusillus* was recorded in several monads in 1971 but has not been seen in the hectad since then. With *Ranunculus pencillatus* the taxon traditionally recognised as *Ranunculus fluitans* is occasional, but it is probably a hybrid clone rather than the species in view of its low fertility. *Ranunculus x kelchoensis* has recently been found at Fireburnmill.

The **arable fields** are too well farmed to have much of a weed flora. *Fumaria densiflora* was noted near the Lithtillum Burn in 1979 but not since. However *Polygonum rurivagum* appeared near Fireburnmill in 1992 and has persisted. *Borago officinalis* was grown as a crop at Lees Haugh and has it has persisted there as a weed.

The **ruderal habitats** at Coldstream are interesting mainly because of the extensive network of tall stone walls and the curious walkway above the Tweed where there is a retaining wall topped by somewhat unstable sun-baked sandy banks. *Mycelis muralis* is plentiful on walls while *Lactuca virosa* is a long-established feature of the banks with *Calendula officinalis* a more recent arrival that is now fairly well naturalised. At the foot of the walls nearest the river *Malva*

neglecta is found with *Valerianella locusta* and *Veronica polita*. The latter is also occasional in paved areas about the town. *Centranthus ruber* is plentiful while *Buddleja davidii* and several *Cotoneaster* species are more recent arrivals.

NT84 Swinton

(Systematic sample surveys 1993, 2009)

Overview

81% of the hectad NT84 is in Berwickshire. It lies between 3m on the Tweed at Blount Bank and 95m at Hirsell Law. The geology is calciferous sandstones of the Carboniferous overlain with glacial drift. This is the heart of The Merse with much good agricultural land. It was not always so. When the botanists came to record the flora in the 1830's it was but a generation since drainage had destroyed much of the remaining wetland that lay in hollows between 'rigs' of drier ground in a corrugated landscape shaped by the ice sheets of the last ice age. Almost the full range of plant species formerly present was still there to be found in the 1830's, albeit often in fragmented habitats, but many species have gradually succumbed to further drainage and eutrophication so that it is now difficult to visualise the former habitats on the ground.

Part of The Merse is drained by the Leet Water, which cuts across the general lie of the land and meanders for several kilometres across haughs between grassy banks. There its flora has fared better, though the aquatic flora has largely been lost to eutrophication. On a larger scale the river Tweed also cuts across the lie of the land and there is some natural grassland both by the riverside itself and where there are steep banks. These banks were once wooded, and some are again today, but almost all natural woodland in the area was lost in centuries of Border conflict. However the aquatic flora of the Tweed has survived to a remarkable extent.

Nevertheless there are some great landed estates where a range of habitats survive. The Hirsell Estate, to which public access is provided on a particularly generous scale, has extensive woodlands that do relate back to earlier more natural habitat as well as grassland and wetland. Further habitat of interest occurs on the Ladykirk and Milne Graden estates, some of it accessible from the riverside walks.

Swinton is the principal village, while a small part of Coldstream extends into the hectad. Lennel and Ladykirk are smaller settlements.

Sites with at least moderately good habitat	GR – NT
Lithtillum Loch	8040, 8041
Birgham Wood (see NT73)	8040
Rough Haugh, Wylie Cleugh	8042, 8043, 8142
The Hirsel	8240, 8340
Hirsel Lake	8240
Hirsel Woods	8141, 8241, 8242
Tweedmill	8644, 8743, 8744
Milne Graden	8644, 8743, 8744
Ladykirk House, near	8844, 8845
Ladykirk, Blount Bank (also NT94)	8847, 8945, 8946, 8947

Habitats

Formerly there were modest areas of **lowland heath** at Birgham Muir and Skaithmuir along a ridge of sandy ground. The heath was sandy and supported southern species not known elsewhere in Berwickshire such as *Genista tinctoria*. Some of this heath is now woodland and heathland species survive in small quantity on the rides: *Centaureum erythraea* in Lithtillum Wood and *Potentilla x mixta* there and in Dunglass Wood, though *Calluna* appears to have died out in the last 50 years.

The more extensive **woodlands** lie on the Hirsel estate and some are associated with **wetland habitats**. Lithtillum Loch is drained but there is a pond in the marsh that remains and here *Rumex maritimus* survives precariously on the muddy margins. The marsh is dominated by *Carex riparia* and willows while *Mentha arvensis* occurs on the woodland rides adjacent. Birgham Wood is described under hectad NT73 but there is a good colony of *Cirsium heterophyllum* in a wet glade within willow carr, near the new pond that has unfortunately destroyed a second colony. The wooded policies at The Hirsel contain many old trees, in some places with a shrubby understory and open glades. These have allowed *Primula veris* to prosper with a double-flowered variety of *Saxifraga granulata*, doubtless naturalised from an introduction. *Mycelis muralis* is widespread and may be an accidental introduction that has spread. The woods at a distance from the house are managed in a way that preserves some more natural features. Notable relict species are *Pyrola minor* and *Gymnocarpion dryopteris*, but *Listera ovata* has not been seen since 1985. Both *Betula pendula* and *B. pubescens* are frequent and this is perhaps the one area in Berwickshire where *B. pendula* might have a true native population. Elsewhere it is naturalised from plantings and now much planted, almost to the exclusion of *B. pubescens*. There is short elm dean by the Graden Burn in the private policies of Milne Graden with abundant *Allium ursinum*. Here

Campanula latifolia is presumably native but *Mycelis muralis* and *Milium effusum* are probably introductions.

The **Leet Water** is notable as a **wildlife corridor** across the heart of the agricultural land of The Merse with grassland, wetland and fragmentary woodlands. At The Hirsell *Senecio aquaticus*, with the hybrid *S. x ostenfeldii*, and *Rumex conglomeratus* occur in the cattle-plodged river margins while the haugh fields support *Festuca pratensis* and *X Festulolium loliaceum* with *Alchemilla* species. Throughout the corridor the banksides have much *Brachypodium sylvaticum* with frequent *Hypericum hirsutum* and a little *Agrimonia eupatoria*. In Rough Haugh and Wylie Cleugh there are very extensive stands of *Carex riparia* with a little *C. acuta* and *C. otrubae*. There are a few modest colonies of *Schoenoplectus lacustris* in the Leet itself or at its banks. *Carex pendula* is also present but may or may not be native

Elsewhere in the hectad **species-rich grassland** is almost confined to the banks of the Tweed. However at Ladykirk there is a steep grass field, sadly now under-grazed, with *Centaureum erythraea* and *Myosotis ramosissima*. The roadside verges are sometimes quite broad and some grassland species are preserved in them: *Agrimonia eupatoria* in several places, *Knautia arvensis* more rarely, *Silaum silaus* only at Butterlaw and *Galium boreale* remarkably near Hirsell Law crossroads. *Sedum telephium* also occurs near Hirsell Law but is probably naturalised from dumped material. *Galium mollugo* has several colonies at The Hirsell and again south of Swintonmill. *Cicerbita macrophylla* is now quite frequent by roadsides as is *Hyacinthoides x massartiana*. *Calystegia sepium* is so plentiful on hedges that it is now difficult to appreciate that this was a novelty when first recorded in Berwickshire at Ladykirk in 1829, seemingly introduced with hedging plants. The parkland at Ladykirk House has old ridge and furrow visible and there *Ranunculus bulbosus* is plentiful on the ridges.

There are few **ponds**. Much the largest is Hirsell Lake. This has a modest aquatic flora where *Ceratophyllum demersum* and *Potamogeton pusillus* have now been joined by *Lemna minuta*. At the margin there is much *Solanum dulcamara* and a little *Carex vesicaria*, while *Scutellaria galericulata* was recorded in 1997 in a reed bed, now the only colony known in Berwickshire if indeed it is still present. A pond at Morningbank which seems to be a remnant of a former oxbow of the Leet Water has a strong colony of *Schoenoplectus tabernaemontani*, the only Berwickshire station, while a pond at Little Swinton has a colony of *Veronica catenata* and also the hybrid *V. x lackschewitzii*. A pit in Newton Quarry may still have the charophytes *Chara globularis/virgata* agg. and *C. vulgaris*. Here the scrub adjacent has a colony of *Vicia tetrasperma* as a presumed introduction. The quarry has recently been reopened after a period of disuse.

The **River Tweed** aquatic species are well represented in the hectad: *Potamogeton lucens*, *P. x salicifolius*, *P. pectinatus* and *P. perfoliatus* form the core of the pondweed community and are frequent while the status of *P. pusillus* and *P. x olivaceus* is uncertain. *P. x bottnicus* is currently known only at the foot of the pool below Blount Bank. With *Ranunculus pencillatus* a taxon traditionally recognised as *Ranunculus fluitans* is occasional, but it is probably a hybrid clone rather than the species in view of its low fertility. *Elodea nuttallii* is a recent arrival. The banksides are varied with some sandstone rock exposures, dry grassland and woodland fragments. *Lactuca virosa* is well represented at Coldstream and occurs again below Lennel, above Milne Graden and at Blount Bank. *Campanula latifolia* is occasional in woodland, as are *Carduus tenuifolius*, *Knautia arvensis* and *Origanum vulgare* on dry banks and *Carex acuta* is frequent at the river's edge. Near Ladykirk House the sandstone rocks harbour an amazing colony of *Asplenium marinum* at a considerable distance from the sea, though ivy has been encroaching and has had to be cut back. Here too is *Ballota nigra*. *Galium boreale* survives on rocks by the river at Blount Bank with *Rubus caesius* nearby. Amongst the introductions *Acorus calamus*, *Allium vineale*, *Butomus umbellatus* and *Silybum marianum* are increasing modestly, *Lysimachia vulgaris* and *Scrophularia umbrosa* are long-naturalised while *Glyceria maxima* is increasing extravagantly. *Heracleum mantegazzianum* has been extensively controlled but is far from eradicated. *Crambe hispanica* escaped in quantity when a crop flooded in 2005 at Lees Haugh and flowered plentifully where silt was deposited but has barely persisted while *Poa palustris* appears to have persisted unnoticed for a century or more at muddy river margins, but in very small quantity. It is not known how long *Myosoton aquaticum* has been present at Milne Graden. A recent colonist above Tweedmill is *Cochlearia megalosperma* which has naturalised in quantity on a dripping rock face.

The **arable fields** have but a poor weed flora. *Aethusa cynapium* was noted near Butterlaw while *Anagallis arvensis*, *Lamium amplexicaule*, *L. confertum*, *L. hybridum* and *Persicaria lapathifolium* are infrequent. *Mentha arvensis* is not recorded as an arable weed, being known solely on woodland rides. *Matricaria recutita* is increasing while *Aleopecurus myosuroides* is an unwelcome recent arrival. Game crops have brought some unexpected species, such as *Chenopodium quinoa* and *Persicaria pensylvanica* which are deliberately grown for their abundant seeds.

The **ruderal habitats** at Swinton and Coldstream have modest interest. *Veronica polita* is occasional while *Buddleja davidii* and *Conyza canadensis* are but recent arrivals.

NT85 Chirnside

(Systematic sample surveys 1998, 2012)

Overview

All of the hectad NT85 is in Berwickshire. It lies between 20m by the Whiteadder Water below Hutton Hall and 233m at Bunkle Edge.

Over half the hectad, the southern section, lies on the Carboniferous sandstones. This includes the course of the Blackadder and Whiteadder Waters, though there are deposits of alluvium on the haughs. From Chirnside northwards the slightly higher ground marks the upper Old Red Sandstone with a small section of the lower Old Red Sandstone to the north of the Billiemire Burn.

A great deal of the hectad is productive arable land with very little botanical interest. The banks of the Blackadder and Whiteadder Waters provide the principal habitats of interest. Below Allanton, where the two rivers join, there is the start of the deep secluded valley that continues downstream to the English Border. The haugh and woodland at Edington Mill was the best example of such habitats in the hectad, but its character has been much altered of late by a housing development on the site of the old mill. Bunkle Wood was a fine woodland and wetland site until the 1940's, though somewhat modified by nineteenth century plantings, but little remains. Edingtonhill Moor is similarly reduced with just a tiny fragment of old birchwood at Blackburn Fox Covert.

The mansion houses, or their ruins, sit at strategic points overlooking the Blackadder and Whiteadder except for Manderston whose extensive policies are set out on more open land.

The town of Chirnside is the main settlement, with villages at Edrom, Whitsome and Allanton.

The disused railway from Duns to Reston crosses the Whiteadder Water at Chirnsidebridge and then follows the Billie Burn which marks a pre-glacial course of the Whiteadder. There is a paper mill at Chirnside Bridge where the waste tip was at one time a productive hunting ground for adventive plants. At Causewaybank a sand and gravel pit was worked until recently but has now been landscaped for wildlife around a large pond.

Sites with at least moderately good habitat	GR - NT
Kimmerghame	8050, 8051, 8151, 8152, 8252
Bunkle Wood	8058, 8158
Edrom, Blanerne	8255, 8256, 8356
Kelloe, Blackadder Mount, Allanbank	8453, 8553, 8554
Ninewells	8555, 8655
Billie Castle	8559
Allanton Bridge, Whitehall, Bluestoneford	8654, 8754, 8755, 8855
Causewaybank Sandpit	8759, 8859
Lazybeds Plantation	8857, 8956, 8957
Edington Mill, Pear Bank	8855, 8954, 8955

Habitats

The **riverside** banks of the Whiteadder and Blackadder Waters have a variety of habitats. At Marden on the Whiteadder there is a little woodland interest by the mouth of the Mack's Burn with *Campanula latifolia* while *Agrimonia eupatoria* and *Knautia arvensis* occur in the grassland. Downstream at Blanerne there is an attractive haugh with *Berula erecta* and *Stellaria nemorum* while the woodland has a little *Hyacinthoides non-scripta* as well as *Allium ursinum*. The *Carex pendula* may be self-sown from policies at Edrom. At Chirnsidebridge there is a complex of habitat fragments including wetland up the Billie Burn. *Leontodon hispidus*, *Ononis repens* and *Vicia sylvatica* occur sparingly on the braes with *Alisma plantago-aquatica*, *Carex acutiformis* and *Isolepis setacea* in the wetland. The *Epilobium roseum* is more associated with the buldings than the riverside. Downstream the scaurs of the Blue Braes are topped in spring with a fine show of blossom from *Prunus avium* and the Whiteadder there has a colony of *Ranunculus x kelchoensis*. There is a modest colony of *Rubus caesius* at Hyndhaugh Braes while at Ninewells there is a wooded bank with *Geranium sylvaticum*, *Saxifraga granulata* and a wide variety of associates. Here also is *Daphne laureola*, a well-naturalised introduction frequent on steep banks by the Blackadder and Whiteadder as also at Steeple Heugh below Whitehall and in the wood between Bite-about Wood and Edington Mill.

Further south the Blackadder below Nisbet Bridge has an interesting aquatic flora with *Berula erecta*, *Potamogeton x olivaceus*, *Ranunculus circinatus x fluitans*, *Schoenoplectus lacustris* and *Sparganium emersum*. *Ranunculus circinatus* was recorded here in 1973 but appears to have gone. Similar communities occur around Mouth Bridge and Kelloe Bridge with the addition of *Ranunculus x*

kelchoensis. Both the *Ranunculus* hybrids tend to have double flowers but those of *R. x kelchoensis* are considerably the larger.

Kimmerghame has some unexpectedly fine banks of *Hyacinthoides non-scripta* only recently faced with competition from *Allium paradoxum*. From Kelloe through to Allanton the river valley deepens and there is much more woodland with such species as *Adoxa moschatellina*, *Cardamine amara*, *Campanula latifolia*, *Chrysosplenium alternifolium*, *Festuca gigantea* and *Veronica montana*. By the Blackadder below Blackadder Mount there is an area of alder wood crossed by a long-disused millstream. Here *Chrysosplenium alternifolium* is frequent. It is associated with a colony of *Carex pendula* which may or may not be native. Around Blackadder Cottage there is a little *Galium mollugo* by the old drive to Blackadder House, *Listera ovata* in the woodland and a large suckering patch of *Euonymus europaeus* which is probably an introduction.

There is an interesting group of introductions along the old drives to Blackadder House. Near the Allanton entrance there is much *Poa chaixii* with *Carex sylvatica* (the latter being both native and an introduction in the area). The north drive down to Blackadder Cottage has *Luzula luzuloides* and a large colony of *Brachypodium pinnatum* (not the recently recognised *B. rupestre*).

The two rivers join at Allanton Bridge which is another station for *Potamogeton x olivaceus* and *Ranunculus x kelchoensis*. The haugh below has recently lost its few seasonal pools to drainage but a small mire at the east end survives with *Carex paniculata* and *Dactylorhiza purpurella*. The *Salix pentandra* nearby could be native or planted. The grassy braes are now largely ungrazed and much of the interest has been lost to coarse grasses and scrub. However there are still many species of both dry and wet grassland on base-rich soils. Steeple Heugh below Whitehall is a wooded riverside crag with a grassland and woodland flora including *Galium odoratum*, *Hypericum hirsutum* and *Saxifraga granulata*. There are further grassland and wetland fragments around and below Bluestoneford. At the foot of Bite-about Wood and on Pear Bank there is a little scrubby woodland of some modest interest where *Carex remota* is found. Downstream, below Hutton Castle and above and below Edington Mill, there are woodland and scaurs with *Hieracium* species. Below the mill is a haugh which was a rich grassland site until recently. However it is not now managed as such following a housing development at the old mill and its interest has declined though *Epilobium roseum* has prospered there with the disturbance. In particular *Galium mollugo*, which had its best Berwickshire colony here in 1984, is no longer evident. The old mill lade and pools and runs in the river associated with the cauld support an aquatic flora with *Potamogeton x olivaceus*, *Ranunculus x kelchoensis*, *Sparganium emersum*, *Veronica catenata*, *Zanichellia palustris* and the charophyte *Chara globularis/virgata* agg.. *Scirpus sylvaticus*, frequent by the riversides along the

Whiteadder, grows nearby. *Pinguicula vulgaris* had an unlikely station in a flush on the slopes but may not now survive. Grassland species include *Agrimonia eupatoria*, *Hypericum hirsutum*, *Knautia arvensis*, *Ononis repens*, *Origanum vulgare* and *Trifolium medium*. Woodland species include *Campanula latifolia*, *Polysticum aculeatum* and *Vicia sylvatica*. A long-established colony of *Artemisia absinthum* survives precariously by the lane near the old mill. Swallow Heugh lies at the downstream end of this woodland. Here on the eroding slopes grow *Agrimonia eupatoria*, *Clinopodium vulgare* and *Lathyrus sylvestris*.

The banks of the Whiteadder are much colonised by *Allium paradoxum*, *Doronicum pardalianches* and *Heracleum mantegazzianum*, though the latter is now controlled up to a point. The *Allium* is proving adept at colonising steep slopes. While the bulbils have been transported by vehicles in some places, much colonisation can be attributed to the hooves of roe deer as the plants often follow the line of their tracks. One of the species most at risk to the *Allium* is *Adoxa moschatellina*, which is now very scarce in the riverside woods. *Impatiens glandulifera* is now invading also. More acceptable introductions are *Claytonia sibirica*, *Scrophularia umbrosa*, *Symphytum tuberosum* and, more locally, *Myrrhis odorata*. *Butomus umbellatus* has colonised by the Blackadder and by the Whiteadder below the junction of the two rivers at Allanton.

Away from the rivers there are but a **miscellany** of habitat fragments. The **policies** at Manderston are a possible former station for the introduced *Alchemilla tythantha* which was found in 1959 in unnamed mansion policies near Duns. The policies only retain remnants of the former woodland and grassland flora in such species as *Geranium sylvaticum* and *Ranunculus bulbosus* though the pond has a large colony of the charophyte *Chara globularis/virgata* agg.. *Veronica polita* occurs in the vegetable garden with *Montia fontana* subsp. *chondrosperma* on a gravel path. Bunkle Wood is now just a strip of **wet woodland** where the old birches now mingle with mixed plantings. Here *Dryopteris carthusiana* and *Potentilla palustris* give a hint of its former glories and *Salix pentandra* appears native in a flush on a bank with *Crepis paludosa*. *Lemna minuta* has now colonised a pool in the wood. A little to the north, above Bunkle Castle, a good population of *Ophioglossum vulgatum* flourishes on an unlikely **grassy bank**. Middlestots **pond** has *Isolepis setacea*, *Rumex conglomeratus* and *Veronica scutellata*. Of the **woods away from the rivers**, Craigswall Wood was much visited by the Berwickshire Naturalists' Club in the nineteenth century in search of the *Polygonatum odoratum* claimed from there. However a surviving herbarium specimen from 1878 demonstrates that the plant was in fact *P. multiflorum* and is considered to have been a naturalised introduction, as in several other places in Berwickshire. The wood is now a plantation with a few wet areas. The former interest of Old Pistol Plantation is also believed to be lost. Lazybeds Plantation, once known as Maines Wood, has a substantial area of mature alder wood with

much *Caltha palustris*, but no notable species have been found there. The old tarmac at Winfield **Airfield** has a large and most unexpected colony of *Echium vulgare* associated with plentiful *Galium mollugo*, *Vulpia bromoides* and a little *Sherardia arvensis*. Here also, as introductions, are *Malva moschata*, *Vicia tetrasperma* and *Vulpia myuros*. Tiny remnants of Edingtonhill **Moor** can be traced in Blackburn Fox Covert with *Ceratocaphnos claviculata* and *Crepis paludosa*.

The Billie Burn flows through the long-drained former **wetland** of Billie Mire, once the haunt of bittern, though tantalising traces remain in small wet areas cut off from the burn by the disused railway where *Carex paniculata* and *C. riparia* are still found. Altogether more surprising was a small area of **base-rich grassland** in a railway cutting below Oldcastles. Here, with such modest associates as *Trisetum flavescens* and *Linum catharticum*, a colony of the rare *Alchemilla glaucescens* was found. This was thought to be an introduction with railway ballast until the more extensive colony at Hilton Bay was discovered, where it grows in a very species-rich calcareous grassland community. Sadly, this community has recently been largely lost to coarse grasses and scrub with just two plants of the *Alchemilla* and a little *Knautia arvensis* remaining. Nearby, a tributary of the Billie Burn runs past the ruins of Billie Castle in a shallow dean. Here there are some old trees, mainly alder, and grassy banks and flushes with *Alchemilla filicaulis* subsp. *vestita*, *Carex disticha*, *C. flacca*, *Conopodium majus*, *Dactylorhiza fuchsii*, *Leontodon hispidus*, *Lychnis flos-cuculi* and *Stellaria holostea*. These include some of the plants Dr George Henderson celebrates in the poems he wrote between about 1820 and 1860 so there is a nostalgic pleasure in enjoying them here in one of the spots he mentions.

Nearby at Causewaybank an exhausted **sand and gravel pit** has now been converted to wildlife habitats with a fair degree of success. *Littorella uniflora* has colonised the pond but it remains to be seen how long the grassland introductions survive. These include *Centaurea scabiosa*, *Clinopodium vulgare*, *Daucus carota*, *Echium vulgare*, *Malva moschata*, *M. neglecta*, *Plantago media*, a cultivar of *Primula veris* and *Scabiosa columbaria*. *Listera ovata* has colonised naturally.

The hectad is rich in **arable weeds**, though populations are mostly small and highly localised. *Centaurea cyanus* has been recorded repeatedly over two centuries but its reappearance in 1998, seemingly from the seed bank, at Edrom Mains was a surprise. Amazingly, the small colony was discovered quite independently by two botanists within a few weeks of each other. However this pales into insignificance beside to the discovery of a field at Lintlaw where *Centaurea cyanus* was recorded as plentiful in 1834 and 1893 and where it still appears year by year, sometimes in quantity. It is resistant to the herbicides Ratio SX and Duplosan applied mid-April. Another field between Edrom and Todheugh

is remarkable in a different way. Here *Aethusa cynapium* was seen in quantity in both 1986 and 2004. In 2004 it was accompanied by *Fumaria muralis* subsp. *wirtgenii*, *Lamium amplexicaule*, *L. hybridum*, *Ranunculus sardous* and *Viola tricolor*. *Anagallis arvensis* was recorded here in 1986. There were several other records of the rapidly-declining *Anagallis arvensis* in the 1980's and 1990's, but it has only been seen once since 1999, near Broomdykes. *Viola tricolor* was seen only once in 2012, near Mouth Bridge with *Thlaspi arvense*. *Persicaria lapathifolia* occurs rarely in damp field corners but is also found as a riverside plant. A large population of *Mentha arvensis* was seen in turnips near Blackadder Mount in 1986, the only relatively recent record for this species in Berwickshire in an arable habitat. Back in 1986 *Papaver dubium* subsp. *lecoqii* was noted in the vegetable garden of what was then the Chirnside House Hotel; in 1999 it was found again by Edington Castle. Arable weeds have recently been sown in quantity at Oldcastles in conservation strips. *Centaurea cyanus* and *Chrysanthemum segetum* have been accompanied by grassland species such as *Daucus carota* and *Malva moschata* while the presence of *Sherardia arvensis* may relate to an accidental introduction or to a surviving seed bank. *Melilotus* species have been sown in game crops.

The **roadsides** have the now-ubiquitous halophytes *Atriplex prostrata*, *Puccinellia distans* and *Spergularia marina* (but not *Cochlearia danica*), recently joined by *Sagina maritima* which was seen once in 2012. However *Atriplex littoralis*, seen near Edington Castle in 1999, has not persisted. *Rumex longifolius*, found at the roadside near Chirnside in 1998, was not recorded in the hectad in 2012 but one plant was found below Oldcastles in 2013. There has been no increase in *Artemisia vulgaris*, which remains a very local species in Berwickshire.

NT86 Grantshouse

(Systematic sample surveys 1996, 2011)

Overview

99% of the hectad NT86 is land, all of which falls in Berwickshire. It lies between sea level and 268m at Drakemire Strips on the slopes of Bunkle Edge.

Most of the hectad lies on Silurian rocks but a tongue of Lower Old Red Sandstone underlies the villages of Auchencrow, Reston and Coldingham. The Silurian is not all acid rock: there are streaks of calcareous sandstone and some small intrusive features.

This is one of the most species-rich hectads in Berwickshire with a short stretch of coast, woodland, grassland, arable, wetland and moorland. While much of the

natural habitat has become fragmented, there is a fine section of grassland, wetland and moorland at Coldingham Common, Dowlaw Moss and Lumsdaine Dean which is distinct from comparable habitats further inland in Berwickshire on account of the oceanic influence. Coldingham Loch is the only natural loch of any size in the county.

There is now conifer forestry at Penmanshiel Moor and Lumsdaine Moor with some smaller blocks elsewhere. A wind farm has been erected at Moor House.

There are villages at Auchencrow, Grantshouse, Reston and Coldingham. The A1 trunk road and the railway pass through the hectad following the Eye Water upstream to the low ridge at 118m near Grantshouse which separates its watershed from that of the Pease Burn.

Sites with at least moderately good habitat	GR - NT
Grantshouse, Eye Water	8064, 8065, 8164
Redclues Cleugh (see NT76)	8068
Greenside Hill	8068
Old Cambus Townhead	8068, 8069
Grantshouse Quarry, Brockholes Wood	8165, 8265
Winding Burn, Howpark Burn	8165, 8166, 8266
Atton Dean	8264
Greenburn Plantation	8361
Harly Darlies	8369
Drone Moss and moor adjacent	8466, 8467
Dowlaw Moss	8369, 8468, 8469
Long Moss, Coldingham Common	8468, 8567, 8568
Lumsdaine Dean	8569, 8669
Lowries Knowes	8569
Rough Heugh, Brander Heugh (part NT87)	8769, 8770
Buskin Burn	8866, 8867, 8965, 8966
Westerside Dean	8869
Coldingham Loch	8968
Earnsheugh	8969

Habitats

The low altitude **moorland** on the Silurian is in many ways the key feature of the hectad. There was formerly moorland along the ridge known as Bunkle Edge, but this has been lost together with a wetland complex at Drakemire, leaving a few tantalising patches of moorland habitat in the shelter belts. Penmanshiel Moor

with its bogs has gone too, as has part of the moorland and moorland-edge at Lumsdaine. *Lycopodium clavatum* has colonised by the new forestry tracks at Penmanshiel Moor and a range of moorland species still find a restricted home there. The convoluted ownership history of Coldingham Common has contributed to its survival. Part of the main block of heather is now ungrazed under a SNH management agreement and the lack of grazing is allowing coarse grasses to invade the rich flush system. The adjacent land at Dowlaw Moss and Lumsdaine Dean is grazed by sheep and cattle and, despite changes over the years, some fine habitats prosper with an acid fen, base-rich flushes, rocky knowes and an area of species-rich wet meadow, the last the only surviving example of its kind in Berwickshire that is relatively undamaged.

Dowlaw Moss has been partly drained in the past and there is no longer any permanent open water, but *Carex curta*, *Drosera rotundifolia* and *Potentilla palustris* flourish with much *Hydrocotyle vulgaris* at the margins. The moorland-edge adjacent has a small colony of *Potentilla anglica*. Dowlaw Burn follows a post-glacial meltwater channel cut northeast across the line of the natural southeasterly fall of the land. The head of the burn is marked by a fine series of flushes. Here grow colonies of *Dactylorhiza incarnata*, both *subsp. incarnata* and *subsp. pulchella*, with *Eleocharis quinqueflora*, *Narthecium ossifragum*, *Parnassia palustris*, *Pedicularis palustris* and *Sagina nodosa*. The knowes by the burn mark the beginning of Lumsdaine Dean and have *Erica cinerea*, *Helianthemum nummularium* and *Koeleria macrantha*. A few spikes of *Gymnadenia conopsea* still appear in the grassland with a little *Salix repens*. Downstream the dean deepens sharply with waterfalls and the rocky banks provide habitat for a number of annual species: *Filago minima*, *F. vulgaris* and *Spergularia rubra* with *Cynoglossum officinale*. *Prunus padus*, *Rosa pimpinellifolia*, *R. rubiginosa* and *Solidago virgaurea* are found by the burnside. To the south, just above the dean, the series of flushes continues with *Eriophorum latifolium*, *Euphrasia scottica* and *Selaginella selaginoides* in addition to most of the species in the flushes higher up the burn. Intergrading with the flushes, the species-rich wet meadow has *Alchemilla filicaulis subsp. vestita*, *Briza media*, *Dactylorhiza fuchsii*, *Festuca pratensis*, *Geranium sylvaticum*, *Geum rivale*, *Helictotrichon pubescens*, *Trifolium medium* and *Valeriana dioica*.

In the centre of Coldingham Common lies Long Moss, a valley mire much cut over for peat by the feuars. Some of the horrendous peat-holes have *Vaccinium oxycoccus*. Around a small bog pool there is a considerable area with birch and willow carr and some open areas where wetland communities have re-stabilised following the cessation of peat cutting. *Corallorhiza trifida* and *Pyrola minor* are found in the woodland while *Trientalis europaea* flourishes in the wetland. However *Platanthera bifolia* has not been refound in recent years. The drainage to the north leads into the flushed area that extends down to the Dowlaw Burn. Sadly

there is now a high risk of invasion by *Picea sitchensis* and *Rhododendron* from the recent forestry plantings adjacent.

South of Moor House much of the moorland is now the site for a wind farm but there is an area of wet heath adjacent to Drone Moss. This raised bog has been cut over and very little active *Sphagnum* remains with its *Vaccinium oxycoccus* and *Narthecium ossifragum*. It is overlooked by a caravan park whence *Rhododendron* is invading. The birch and willow carr at the fringe conceals some base-rich springs where a good colony of *Trollius europaeus* survives with *Listera ovata*. *Pinguicula vulgaris* is found in a more open community. *Trientalis europaea* is present in modest quantity at the edge of the ran woodland. Some of the pools in the woodland have *Carex curta* at their edges and one has a colony of *Hippuris vulgaris*.

A scrap of wet birchwood at Silverwells, all that remains of formerly more diverse habitat, was also a site for *Corallorhiza* until recently, but part was developed as a woodland garden in connection with a nursery and the orchid does not appear to have survived though *Carex remota* has been seen recently in the glen below. A few unexpected garden plants have naturalised in the glen. There is a colony of *Primula florindae* and a few inoffensive plants of *Lysichiton americanus*.

Woodland is mainly represented by plantations on the site of former oakwoods along the Eye Water and by small deans. The oakwoods were once managed by the monks of Coldingham Priory. Around Grantshouse a small part of the Penmanshiel woods falls in the hectad including Redclues Cleugh whose oaks have *Ceratocaphnos claviculata* and *Melica uniflora* as associates, with a lone bush of juniper by the head of the burn. The Howpark Burn above Grantshouse, with its tributaries Winding Burn and Harelaw Burn, has a little natural woodland. Here the wood pasture has been superseded by new planting which is eliminating the grassland species. *Juniperus communis* and *Rosa pimpinellifolia* are accompanied by *Gymnocarpion dryopteris*, *Helianthemum nummularium* and *Sanicula europaea*. A lone bush of *Salix myrsinifolia* could not be refound in 2011. Following the Eye Water downstream from Grantshouse, *Prunus padus* is much in evidence and Brockholes Wood still has an excellent ground flora of *Hyacinthoides non-scripta* with much *Adoxa moschatellina* and a few old oak stumps under the plantation. Atton Dean has *Galium odoratum*, *Melica uniflora* and *Polystichum aculeatum*. Brockholes Dean also has the *Melica*, though it has recently been converted into an arboretum for exotic trees and shrubs. Little is left of the old Green Wood, though *Carex laevigata* and *C. remota* survive precariously at the plantation margin with old bushes of *Viburnum opulus* which could conceivably be native, unlike those in the plantings nearby. There is a small colony of *Stachys officinalis* on a bank nearby. Houndwood no longer has a wood of that name, other than some wet scraps with a large colony of *Galium odoratum*,

which is so robust that it may be a horticultural variety naturalised here. Considerable efforts have been made to restore woodland habitat by the Eye Water below Houndwood following the construction of dual carriageway on the A1 and some wildflower mixes have been sown quite extensively. *Lythrum salicaria* and *Sanguisorba officinalis* have established with a substantial quantity of *Rhinanthus minor*. There are further scraps of woodland at Howburn and Coveyheugh with modest deans at Lemington and Houndwood House.

A further series of deans are found along burns flowing southeast to the Ale Water, Fleurs and Coldingham. While the immediate policies of Press Castle have some pleasant woodland habitat, such habitat upstream by the Grange Burns has been almost entirely absorbed by housing and conifer plantation though there is still one good colony of *Pyrola minor*. *Claytonia sibirica* has colonised not unpleasantly from Press Castle down the length of the Ale Water. The lower parts of Buskin Burn run through a dean down to Coldingham. The trees are mainly plantings but the rocky burnsidess and the banks above have quite a rich woodland flora. There is much *Phyllitis scolopendrium* and *Polystichum aculeatum* by the burn with a little *Polystichum setiferum* and *P. x bicknellii*. *Campanula latifolia* is rather scarce.

To the west of Auchencrow there is a plantation at Greenburn, south of Bunkle Edge, with tiny remnants of a moorland-edge and dean woodland flora including *Carex viridula* subsp. *brachyrrhyncha*, *Erica tetralix*, *Polystichum aculeatum* and *Stellaria holostea*

Some of the **wetlands** have been mentioned under moorland. At Old Cambus Townhead there is a pond where the water level used to fluctuate leaving a muddy margin which was a habitat for *Apium inundatum* and *Lythrum portula*, but eutrophication, succession and the exclusion of grazing have all but eliminated the mud and neither of these species was refound in 2011. The former moorland setting of this pond has been lost. At Harly Darlies there is small moss, rather separate from the Dowlaw Moss complex, with *Carex curta* and *Hippuris vulgaris*. Towards Dowlaw lies Lowries Knowes pond, which is a reservoir with a dam. The water level fluctuates widely and, in suitable years, *Lythrum portula* and *Ranunculus peltatus* may thrive. However *Littorella uniflora* appears to have gone, probably in response to eutrophication. Another reservoir at West Loch had an unexpected population of *Stellaria neglecta* near the margin, but this is now part of the grounds of a house and has not been visited recently.

Coldingham Loch is an altogether more significant water body with *Nuphar lutea*, *Potamogeton filiformis* and *Potamogeton x nitens*. It also has interesting charophytes, *Chara virgata* and *Tolypella glomerata*. A *Nitella* species has been recorded in the past and could persist. However the loch is unfavourably managed for the botanical interest, despite being an SSSI. It is a put-and-take trout fishery

and a mechanical weed cutter is employed without restraint. Meanwhile a secluded open pool at the north end has been overwhelmed by *Phragmites*. The adjacent ground has largely lost its natural habitat and there appears to be considerable fertiliser run-off from the adjacent fields to the loch.

A new water body of note is Loch Rickie at Lumsdaine. Quite a large water body has been created from former wetland where *Menyanthes trifoliata* is now flourishing and *Nuphar lutea* has been successfully introduced.

Some wetland habitat survives on the haughs of the Eye Water above Grantshouse, despite drainage work, but the fragmented habitats are only modestly species-rich.

Inland grasslands away from the Lumsdaine Dean complex include a tiny knowe at Greenlaw Knowe (or Knowle) with the annuals *Cerastium semidecandrum*, *Stellaria pallida* and *Vulpia bromoides* with *Arabis hirsuta*. Fields at Westerside and West Loch have a series of rocky knowes in otherwise reseeded fields with small populations of a slightly different set of annuals: *Cerastium semidecandrum*, *Geranium pusillum*, *Montia fontana* subsp. *chondrosperma*, *Sagina apetala* subsp. *apetala* and *Vulpia bromoides*. However these populations have declined sharply in recent years and *Stellaria pallida* is perhaps the only specialist species to survive in any quantity in the fields themselves though there is an excellent colony of *Cerastium arvense* on the verge of the lane between Pilmuir and West Loch with a little *C. x maueri*. The *C. tomentosum* parent grows nearby at the entrance to Pilmuir.

The **coast** is but a short strip and is mainly spectacular cliffs. The braes and shore by Brander Heugh at Lumsdaine Shore in NT87 have a wide range of habitats, shared with the section in hectad NT86 known as Rough Heugh. *Carlina vulgaris*, *Polygala vulgaris*, *Thalictrum minus* and *Vicia sylvatica* are features of the braes. *Asplenium marinum* and *Sedum rosea* occur on the cliffs and stacs with fluctuating colonies of *Glaucium flavum* and *Ligusticum scoticum* on the shore. The more sandy parts of the beach support *Atriplex laciniata*, *Cakile maritima*, *Carex arenaria*, *Elytrigia juncea* and *Honckenya peploides*. The former colony of *Dianthus deltoides*, perhaps the last surviving coastal colony, was destroyed when an access track was constructed in the 1990's but the lack of grazing was already threatening it. *Trifolium arvense* survives in a gorge. *Sedum rosea* is also found here but is more plentiful below Westerside Dean to the southeast where *Asplenium marinum*, *Carex otrubae* and *Ligusticum scoticum* are present and one plant of *Atriplex x taschereaui* was found in 2011. The cliff top by Westerside Dean still has a little *Astragalus danicus*, *Erodium cicutarium* and *Filago minima*. Much more secure are *Koeleria macrantha*, *Orchis mascula*, *Primula veris* and *Saxifraga granulata*. There is a large suckering patch of *Rosa pimpinellifolia* in

the dean. The hillside in the field to the southeast of the dean has good colonies of *Hyacinthoides non-scripta*.

Arable weed habitats are fairly restricted. At Sunnyside near Auchencrow one plant each of *Centaurea cyanus* and *Chrysanthemum segetum* appeared in set-aside in 2005 with *Fumaria bastardii*, *F. densiflora* and *F. purpurea*, an amazing assemblage for Berwickshire. *Anagallis arvensis* and *Fumaria bastardii* were seen in a field near Silverwells Dean in 2002. *Lamium amplexicaule*, *L. confertum* and *L. hybridum* are fairly widespread. A spectacular show of arable weeds, especially poppies, could formerly be seen at Reston Sand Quarry, but this has now been closed and only tiny fragments of ruderal habitat remain there.

The **quarry** at Grantshouse is now disused. There *Filago vulgaris* and *Myosotis ramosissima* grow on the old quarry floor and on spoil heaps. *Ribes sanguineum* is well-naturalised nearby.

Allium paradoxum is an **intrusive neophyte** that has spread dramatically across the hectad along the Eye Water in the last decade and may be expected to bulk up its populations in the years ahead to the detriment of other vernal woodland species. *Buddleja davidii* has colonised recently in Reston but is not really a problem there.

The main roads have the usual halophytes. *Rumex longifolius* had colonised the verges of the A1 quite extensively between 1996 and 2007 but only three plants could be found in 2011, a remarkable decline. The railway cuttings have not been botanised.

NT87 Dowlaw

(Systematic sample surveys 1998, 2012)

Overview

Only 6% of the hectad NT87 is land, all of which falls in Berwickshire. It lies between sea level and 174m at Telegraph Hill.

Most of the hectad lies on Silurian rocks but a tongue of Lower Old Red Sandstone running along the coast as far to the east as Red Heugh gives rise to the classic unconformity between the two at Siccar Point. The Silurian is not all acid rock: there are streaks of calcareous sandstone and some small intrusive features.

The rugged coastline accounts for most of the land area. Although it has more wilderness character than anywhere else in Berwickshire it is far from pristine. Improved fields abut the sea braes except for a limited area of degraded moorland

above Rammel Cove and at Telegraph Hill and the sea braes are almost devoid of woodland, so the range of habitats is limited. Dowlaw Dean is a savage place which captures the imagination of all who visit it, but it too is far from pristine.

A turnip factory now blights Old Cambus Quarry though access to the world heritage geological site at Siccar Point is now served by a car park.

There are farmsteads at Old Cambus West Mains, Redheugh and Dowlaw with some arable land. A car park at Dowlaw provides access to the ruins of Fast Castle.

Sites with at least moderately good habitat	GR - NT
Old Cambus Quarry and fields near	8070
St Helen's Church, below	8070
Siccar Point	8170
Redheugh	8270
Lansey Bank, Midden Craig	8370
Rammel Cove	8470
Telegraph Hill	8570
Fast Castle	8670, 8671
Dowlaw Dean	8670
Dowlaw Dean, fields near (part NT86)	8670, 8769, 8770
Brander Heugh (see NT86)	8770

Habitats

The **coastline** with its cliffs and sea braes is the principal habitat. Access to the shore is limited by the cliffs and the beaches are but rough boulders, except at Brander Heugh. *Glaucium flavum* occurs sporadically on the beach below the ruins of St Helen's Church with *Cochlearia officinalis subsp. scotica* above. The latter has also been found at Siccar Point. The shore below St Helen's Church and near Siccar Point has *Carex distans*, *Elytrigia juncea*, *Honckenya peploides* and *Juncus gerardii*. The braes above on the Old Red Sandstone are only locally species-rich with *Anthyllis vulneraria*, *Helianthemum nummularium*, *Koeleria macrantha*, *Orchis mascula*. Some slopes have *Hyacinthoides non-scripta* under bracken. The limited flushed areas have much *Eupatorium cannabinum*. *Stellaria pallida* occurs on knowes in the fields near St Helen's Church but is absent from the sea braes, or almost so.

To the east, near Red Heugh and at Menzies Cleugh, there is a wider range of habitats. The braes add *Astragalus danicus*, *Gymnadenia conopsea*, *Ononis repens*, *Polygala vulgaris*, *Pinguicula vulgaris* and *Saxifraga granulata* to the

species present to the west. There is also a short but spectacular dean through the Old Red Sandstone which has a few woodland species such as *Mercurialis perennis* and *Stellaria holostea* as well as the species of the sea braes. Here there is a surprising colony of *Anagallis arvensis* at the edge of the whins above, while, at the foot of the waterfall, *Primula florindae* is well naturalised alongside *Dactylorhiza purpurella* and *Oenanthe crocata*. *Impatiens glandulifera*, now abundant in the upper part of the burn, is a much less acceptable introduction that may well overwhelm the *Primula florindae*.

East on the Silurian rocks *Filago vulgaris* occurs on an eroding slope at Lansey Bank while a modest colony of *Cirsium heterophyllum* grows with abundant *Equisetum telmateia* in the flushes. *Ligusticum scoticum* is frequent on the shore below with *Rubus caesius* behind. *Asplenium marinum* grows on Midden Craig.

The cliffs from Rammel Cove to Fast Castle are largely inaccessible though it is just possible to reach a surprising woodland relict above Rammel Cove where dwarfed oak and aspen hug the cliff with *Geranium sylvaticum*. Soay sheep were introduced to the braes east of Fast Castle for a while but proved a disaster, as they avoid the rougher vegetation and destroy the diverse communities at the cliff tops by herding together and uprooting the turf. *Astragalus danicus* is now known only on the cliff top at the bay below Dowlaw Dean. Flushed areas have *Equisetum telmateia* and *Eupatorium cannabinum*. *Asplenium marinum* is known around Fast Castle while *Sedum rosea* is recorded at Rammel Cove and between Fast Castle and Dowlaw Dean, but much suitable habitat for these two species is inaccessible.

Dowlaw Dean is in many ways an extension of the sea braes and is perhaps most remarkable for the relatively accessible colonies of *Sedum rosea* and *Thalictrum minus* with *Helianthemum nummularium*, *Orchis mascula*, *Primula veris*, *Saxifraga granulata* and *Vicia sylvatica*. The eroding parts of the cliffs that form the sides of the dean, particularly those near its foot, are refugia for further grassland species including *Allium vineale* and *Valerianella locusta*. More acid sections have abundant *Hyacinthoides non-scripta*. A variety of *Hieracia* occur on the cliffs themselves. The burnside is modestly wooded with oak and alder. Associated species include *Adoxa moschatellina*, *Allium ursinum*, *Campanula latifolia*, *Geranium sylvaticum*, *Polypodium interjectum*, *Polystichum aculeatum* and *Rosa pimpinellifolia*. Parts of the dean have recently become overrun with brambles.

Old Cambus Quarry, like Dowlaw Dean, is a glacial meltwater channel, but is uncomprisingly acid. The quarrying and the recent anomalous construction of a factory have changed its appearance and have eliminated much of the sandy grassland at the foot of the rocky sides of the dean. The annual **grassland** species *Cerastium semidecandrum*, *Filago minima*, *F. vulgaris*, *Geranium pusillum*,

Montia fontana subsp. *chondrosperma*, *Myosotis ramosissima*, *Sagina apetala* subsp. *apetala*, and *Trifolium striatum* have a precarious existence on un-quarried knowes. *Spergularia rubra* is more widespread. *Hyacinthoides non-scripta* is still plentiful. A small **pond** and associated wetland has *Callitriche hamulata*, *Ranunculus aquatilis* and *R. peltatus*.

Telegraph Hill is mainly a mix of species-poor **moorland** and **acid grassland** of interest because of the maritime influence. The knowes have modest interest as refugia for *Sagina apetala* subsp. *apetala*, *Scleranthus annuus* and *Spergularia rubra*, but their populations are very small and may have already been lost.

Despite adverse management, the grassland on the knowes in the fields east of Dowlaw Dean still support a rich community of annuals including *Montia fontana* subsp. *chondrosperma*, *Myosotis ramosissima*, *Sherardia arvensis*, *Stellaria pallida*, *Vicia lathyroides* and *Vulpia bromoides* with *Cerastium arvense*. The colonies of *Vicia lathyroides* are much the largest in Berwickshire.

The **arable weed** flora is quite diverse when cropping allows it to show. Sadly the fields between Dowlaw and Dowlaw Dean are no longer cultivated and indeed part has been planted with a curious mix of trees, including *Pinus pinaster*, some of which might seed into Dowlaw Dean. Species lost include *Erodium cicutarium* and *Stachys arvensis*. Fields near the head of Dowlaw Dean have *Anagallis arvensis*, *Fumaria densiflora*, *Sherardia arvensis*, *Thlaspi arvense* and the three scarcer annual *Lamium* species, *L. amplexicaule*, *L. confertum* and *L. hybridum*. Some of these species only survive at the margins of small unploughed knowes. Old Cambus West Mains, on the Old Red Sandstone, has *Fumaria officinalis* subsp. *wirtgenii*, *Thlaspi arvense* and *Urtica urens*.

There is little **ruderal** habitat in the hectad, but *Hordeum murinum* occurs at Old Cambus West Mains and *Vulpia myuros* in a compost enterprise at Dowlaw. A filter bed of *Phragmites australis* has been installed for the factory outflow at Old Cambus Quarry.

NT94 Fishwick

(Systematic sample surveys 1987, 2007)

Overview

Only 3% of the hectad NT94 is in Berwickshire. It lies between 2m on the Tweed below Fishwick and 54m near Horndean. The geology is calciferous sandstones of the Carboniferous overlain with glacial drift.

The land lies close to the River Tweed where there are grassland and aquatic habitats as well as arable fields. There are also burnside habitats below Horndean.

Sites with at least moderately good habitat	GR – NT
Blount Bank, Blount Island (also NT84)	9047
Frockham Brae, Horndean	9048, 9049
Fishwick Mains, riverside below, St Thomas's Island	9149, 9249

Habitats

The **River Tweed** aquatic species are well represented: *Potamogeton lucens*, *P. x salicifolius*, *P. pectinatus* and *P. perfoliatus* form the core of the pondweed community and are frequent while *P. x olivaceus* occurs below Fishwick Mains. There is a strong colony of *P. x bottnicus* at St Thomas's Island and it is also known at the foot of the pool below Blount Bank. With *Ranunculus pencillatus* a taxon traditionally recognised as *Ranunculus fluitans* is occasional, but it is probably a hybrid clone rather than the species in view of its low fertility.

The **river banks** of the Tweed are varied with some sandstone rock exposures, dry grassland and woodland fragments. *Agrimonia eupatoria*, *Carduus tenuifolius*, *Knautia arvensis* and *Origanum vulgare* occur on dry banks while at the river's edge *Acorus calamus* and *Butomus umbellatus* are scarce, *Carex acuta* is frequent and *Glyceria maxima* has spread excessively. At the foot of Blount Bank there is a little *Ballota nigra*, *Centaureum erythraea* and *Lactuca virosa*. Below Fishwick Mains *Ballota nigra* occurs more plentifully on the sandstone rocks with *Cerastium arvense*, *Ranunculus bulbosus* and *Trifolium striatum* nearby.

Back from the river, the interest of the woodland at Frockham Brae is mainly localised to the bank above the river. The interest of the burnside and grassland along Horn Burn, Lyall's Burn and the seepage below Primrose Plantation is localised in marshy areas by the burns and in the grassland on the steepest banks. There is a little *Berula erecta* in the burn below Horndean. The woodland

fragment just below Horndean village does have woodland axiophytes but, while Primrose Plantation does have *Primula vulgaris*, there is otherwise only a poor ground flora. Nevertheless the mix of habitats is unusually diverse for the lower Tweed.

The **arable fields** adjacent to the river below Fishwick Mains have a rich weed flora. *Fumaria densiflora* occurs with *F. officinalis* subsp. *wirtgenii* while *Lamium amplexicaule*, *L. confertum* and *L. hybridum* grow together. *Amsinkia intermedia* is plentiful. *Draba muralis* has colonised the sandy grassland between the fields and the river.

NT95 Paxton

(Systematic sample surveys 1999, 2013)

Overview

53% of the coastal hectad NT95 is land that falls in Berwickshire. It lies between sea level and 215m at Lamberton Moor. Berwick-upon-Tweed and its bounds, or 'Liberties', have a history as disputed territory, but today fall within England.

The geology is varied. There is a narrow strip of Carboniferous sandstones and limestones along the coastline, inland the higher ground at Lamberton Moor is Silurian. Paxton and Hutton fall on the Carboniferous sandstone while the slope above Foulden to Edingtonhill is on the upper Old Red Sandstone. This meets the lower Old Red Sandstone at the watershed between the Whiteadder and the Eye Waters.

The cliff top north from the English Border below Lamberton has little of botanical interest but there is a rugged undercliff area below which has a character of its own. North again, below Lamberton Shiels, there is a mix of cliffs and sea braes with a varied series of rock strata giving rise to some species-rich habitats especially at Hilton Bay. Most of Lamberton Moor has been destroyed, but a few surprising pockets of vegetation survive. The banks of the Tweed lack much truly natural vegetation but the extensive policies of Paxton House provide refuge for many woodland species. The aquatic flora of the Tweed is diverse, especially near Union Bridge and just above the English border. The fertile arable land is intersected by the Whiteadder Water which runs in a steep-sided valley that gives the riversides an unexpectedly cloistered feel. Here there are relatively rich aquatic, grassland and woodland habitats, albeit considerably fragmented. Edingtonhill Moor is largely destroyed, but here again fragments survive.

There are villages at Paxton, Hutton and Foulden. The A1 trunk road and the mainline railway pass though the hectad.

Sites with at least moderately good habitat	GR - NT
Foulden Braes	9054, 9154
Edington Hill Covert	9057
Foulden Dean	9154, 9254, 9255
Union Bridge	9250, 9350, 9351
Paxton House	9251, 9252, 9351, 9352, 9452
Clarabad Wood	9253, 9254, 9354
Tibbie Fowler's Glen, Witches Cleugh	9354, 9453, 9454
Edrington Castle, Cawderstanes	9352, 9353, 9452, 9453, 9454
Lambsmill Burn, Edrington House	9354, 9355, 9454, 9455
Lamberton Moor	9557, 9558
Lamberton Undercliff	9757, 9758
Lamberton Shiels, shore below, Hilton Bay, Catcairn Bushes	9658, 9659

Habitats

The **coastline** north from the English border commences with undercliff below Lamberton. It is extremely rugged and more or less ungrazed. Much of it is species-poor but there is considerable botanical interest. The wet ledges below the cliffs hold a large population of *Carex pendula*, a rare species in the Scottish Borders with Dunglass Dean being home to the only other sizeable native colony. *Equisetum telmateia* and *Eupatorium cannabinum* are associates. The cliffs themselves have a little *Asplenium marinum* and some colonies of *Populus tremula* with *Allium ursinum* below, suggesting that much of the undercliff is former woodland. While much of the grassland is on the sandstone and is neutral to acid with some bracken, there are some base-rich sections over limestone and calcareous sandstone, often on unstable slopes. Here grow *Agrimonia eupatoria*, *Anthyllis vulneraria*, *Carlina vulgaris*, *Centaureum erythraea*, *Gymnadenia conopsea*, *Orchis mascula* and much *Vicia sylvatica*. A little *Pinguicula vulgaris* occurs in flushes. There are some large colonies of *Rubus caesius*.

The next section northwards includes some small areas of limestone grassland at Hilton Bay which have a specialised community notable for *Alchemilla glaucescens* and *Sanguisorba minor*. These have *Catapodium rigidum*, *Polygala vulgaris* and *Primula veris* as associates. More widely distributed are *Agrimonia eupatoria*, *Carlina vulgaris* and *Helianthemum nummularium*, indeed this may be the best population of the *Agrimonia* in Berwickshire. There is much small-scale habitat variety providing limited opportunities for *Centaureum erythraea*, *Myosotis*

ramosissima, *Trifolium arvense*, *T. striatum*, *Valerianella locusta*, *Viola canina* and *V. hirta* in dry grassland and for *Eleocharis quinqueflora*, *Parnassia palustris*, *Pinguicula vulgaris* and *Selaginella selaginoides* in flushes. Two small bushes of juniper occur on the cliffs, the only known survival on the coast. *Astragalus danicus* grows at the cliff-edge near the ruins of a salmon netting station. It was thought that *Leontodon saxatilis* occurred here, but the plant has now been demonstrated to be a small form of *Leontodon hispidus*, with the normal form not far away.

The presence of the railway precariously close above the eroding slopes of Hilton Bay has led to drastic engineering action. Massive boulders have recently been landed on the beach to build a breakwater to reduce the erosion and plastic netting has been draped over the eroding slopes themselves with a wall of concrete blocks at its foot. The engineering has been fairly successful, which is very bad news for the specialised flora dependent on the erosion to keep the grassland habitat open. The netting has encouraged the spread of whins and other scrub species, so the prospects for the scarce grassland species are bleak indeed, so much so that *Alchemilla glaucescens* could not be refound in 2013.

The former **moorland** above the coast at Lamberton is famous for the remarkable discovery of *Tofieldia pusilla* by John Ray in 1671, new to science, though its locality is now thought to have been just on the English side of the border. Agricultural development of the moorland was much delayed by it being a former war zone and having a fragmented ownership structure. Surprisingly a little survives to this day. One field has a large wet hollow where a calcareous flush community survives more or less intact with *Carex dioica*, *Dactylorhiza incarnata* in two colour forms (or subspecies), *Eleocharis quinqueflora*, *Eriophorum latifolium*, *Parnassia palustris*, *Pedicularis palustris*, *Sagina nodosa*, *Schoenus nigricans*, *Selaginella selaginoides*, *Senecio aquaticus* and the charophyte *Chara globularis/virgata* agg.. The surrounding grassland has *Helictotrichon pubescens*, *Trifolium medium* and *Valeriana dioica*. There is an area of acid grassland with some moorland species to the south and a further flush system towards Mordington with more *Carex dioica* and *Eleocharis quinqueflora*. *Cerastium arvense* grows on the knowes nearby.

Turning away from the coast to the **River Tweed** it should be noted that the estuary is in England and, though the river is tidal in the hectad, the tides more or less just back-up fresh water so the saline influence is small. The Union Bridge provides an easy point of access to the river and it was the scene for some of the early studies of its aquatic species. *Potamogeton lucens*, *P. perfoliatus* and *P. x salicifolius* are still present but *P. x bottnicus* has not been recorded since 1971. A sandstone cliff a little above the bridge is a station for *Lactuca virosa* and *Mycelis muralis* and this is probably where *Echium vulgare* was recorded in 1966. The

status of both the *Lactuca* and the *Mycelis* is debateable, though if they are introductions both are fully naturalised, particularly the *Lactuca*. Just below the bridge the 'female' form of *Petasites hybridus* occurs in small quantity at its only Berwickshire station, apparently as a recent colonist. Near Tweedhill there is a river wall with *Campanula latifolia*, *Chrysosplenium alternifolium* and *Cystopteris fragilis*. Here *Cochlearia megalosperma* has recently colonised. Downstream at Paxton House there is a greater variety of habitats. The aquatic species are similar but much reduced from excessive weed-cutting by fishing interests, though *Ranunculus fluitans* and *Zannichellia palustris* are also recorded with the latter perhaps an indicator of slightly saline conditions through to the English Border where the fish life includes shoals of tiny dabs. The woodland includes modified elm deans with much *Allium ursinum*. Two colonies of *Lathraea squamaria* are known, the colony under yews by the old ice house being a fine one. *Ranunculus auricomus*, so scarce in Berwickshire, is recorded from Linn Dean. *Campanula latifolia* and *Sanicula europaea* are a little more frequent. Riverside grassland plants include *Ononis repens* and *Origanum vulgare* while *Carex acuta* grows at the water's edge with a little *Poa palustris*. *Parietaria judaica* is naturalised on stonework by the river. A pond has recently been colonised by *Lemna minuta*.

The **Whiteadder Water** contrasts with the Tweed in having a much greater diversity of grassland and woodland habitats, though the aquatic flora is somewhat poorer. The junction of the Tweed and Whiteadder is in England. The Foulden braes across the Whiteadder from Hutton Castle Mill to Hutton Mill were, until fairly recently, species-rich grassland with a partly intact haugh below, but the haugh received fertiliser for a time before grazing ceased and the braes have now suffered much scrub encroachment. Meanwhile the woodland on the scaurs at Harper Heugh (or Cripple Nick) has suffered from elm die-back, though the elms have now staged a recovery. A fine colony of *Lathyrus sylvestris* on partly wooded scree under a south-facing cliff at Harper Heugh is a highpoint. This is generally considered to be native. *Mycelis muralis*, as elsewhere, is probably an introduction. *Malva neglecta* is always an archaeophyte at best, leaving *Malva moschata* as just possibly native with the equally problematic *Vicia sativa* subsp. *segetalis*. While these species suggest that their communities might not be easy to classify, comfort may be taken from *Agrimonia eupatoria*, *Helianthemum nummularium*, *Koeleria macrantha*, *Knautia arvensis*, *Ononis repens* and *Polygala vulgaris* in defining a recognisable native calcareous grassland flora. A feature of the Whiteadder is the eroding scaurs at bends in the river with scrub woodland. Species favouring such habitat include *Hypericum hirsutum*, *Origanum vulgare* and *Vicia sylvatica*.

Foulden Dean is a side-dean off the Whiteadder that has much the same flora as the Foulden Braes but part of it is even more calciferous. Here again there has been recent neglect leading to scrub encroachment and the spread of thistles. *Scabiosa*

columbaria just survives on the banks, but the fate of *Listera ovata* and *Viola hirta* is uncertain. Other species present are *Agrimonia eupatoria* and *Ranunculus bulbosus* with *Carex viridula* subsp. *brachyrrhyncha*, *Dactylorhiza purpurella*, *Festuca pratensis*, *Geum rivale* and *Triglochin palustre* near the burn below. Below Hutton Bridge stands Clarabad with a long strip of scrub woodland on the eroding bank below. This has a reasonably complete woodland flora and more hazel than is normal in Berwickshire. Species present include *Phyllitis scolopendrium*, *Polystichum aculeatum*, *Rubus caesius*, *Sanicula europaea* and *Veronica montana*. Following the Whiteadder downstream below Clarabad Mill one comes to the secluded valley known as Tibbie Fowler's Glen after a reclusive woman, supposedly a witch, who once had a cottage there. Much the same mix of species occurs on the braes with further scrub encroachment until the bend of the river is reached where Witches Cleugh lies. The banks here are rich in *Hieracium* species and *Echium vulgare* is present on a cliff as is *Primula veris* above but *Orchis mascula* has not been seen recently.

The Lambsmill Burn runs through another side-dean to the Whiteadder. The woodland is much modified but there is a linn below Edrington House where *Polystichum aculeatum* and *P. setiferum* occur with their hybrid. Woodland species present include *Campanula latifolia*, but the *Gymnadenia conopsea* and *Listera ovata* recorded in 1979 are probably lost.

Below Witches Cleugh the Whiteadder runs to Edrington Castle and Cawderstones. The river here is the station for a colony of *Ranunculus x kelchoensis*, sadly now almost extirpated from excessive weed-cutting by fishing interests. There are oxbows by the river with *Alisma plantago-aquatica*, *Iris pseudacorus* and *Scirpus sylvaticus*. This section was until recently overrun with *Heracleum mantegazzianum*. While that species is much reduced, *Allium paradoxum* and *Impatiens glandulifera* abound leaving vanishingly little habitat for *Chrysosplenium alternifolium*, which could not be refound in 2013. The woodland above the river now holds a sizable colony of *Carex pendula*, believed to have colonised from Paxton village nearby.

Scrophularia umbrosa and *Symphytum tuberosum* are widespread by the Whiteadder and the Tweed while *Butomus umbellatus* has recently become rather plentiful by the Whiteadder.

The hill road from Chirnside to Ayton crosses former **moorland** at Edingtonhill. The Covert there has birchwood with remnants of the moorland flora. *Ceratocaphnos claviculata* is a notable species recorded here in some quantity. A somewhat similar fragment occurs at Hag Wood to the east again with the *Ceratocaphnos*, but this wood is even more modified.

Ruderal habitat fragments include part of the former Winfield airfield with *Echium vulgare*, *Galium mollugo* and *Sherardia arvensis* on the old runway. *Humulus lupulus* occurs in hedges near Paxton where it was first noted in 1831, it also occurs by the Tweed near the foot of the Paxton Linn Burn where it is probably self-sown.

Arable weeds have a hard time of it in the intensively farmed cereal land near the Tweed and the Whiteadder. *Chrysanthemum segetum* is plentiful in some years below Lamberton. There are some fields on the hill above Mordington and Foulden where *Fumaria bastardii* and *F. densiflora* have recently shown up in crops other than cereals. *Lamium amplexicaule*, *L. confertum* and *L. hybridum* are rather more widespread. *Anthemis arvensis*, *Centaurea cyanus* and *Chrysanthemum segetum* were sown in quantity in 2008 in a strip of turnips grown as game cover near Mordington House. *Papaver dubium subsp. lecoqii* has been noted around Paxton and Foulden villages, while *Veronica polita* occurs in the walled garden at Mordington House.

The **policies** of Mordington House are remarkable for their *Araucaria araucana*. The trees may be 200 years old and both sexes are present. A sapling has been noted at the foot of one of them.

The A1 along the coast has the usual **roadside** halophytes. This was one of the first sections for *Cochlearia danica* to colonise, back in 1994. *Armeria maritima* also occurs by the tarmac with a little *Atriplex littoralis*. *Rumex longifolius* grows back from the road. The **railway** bankings were surveyed by a specially-commissioned team of botanists in 1980, when *Bromus erectus* was discovered naturalised near Lamberton. While its presence has been confirmed since, without trespassing on railway property, the full extent of the colony is not known.

NT96 Eyemouth

(Systematic sample surveys 1994, 2010)

Overview

38% of the coastal hectad NT96 is land, all of which falls in Berwickshire. It lies between sea level and 195m at Ayton Hill.

The geology is complex and has been extensively studied. Relatively acid Silurian rocks underlie the higher ground to the west of St Abbs Head and form much of the cliffs between Burnmouth and Eyemouth while tongues of the Lower Old Red Sandstone have weathered to give the productive farmland around Ayton and towards Coldingham. St Abbs Head is an intrusive feature, largely of andesite and

basalt but there is vent agglomerate immediately adjacent in Starney Bay. Further andesite outcrops are responsible for the gorges along the Ale Water and for Hairy Ness by Eyemouth Fort. More vent agglomerate outcrops at Killedraught Bay, Fleurs Dean and St Abbs village. Carboniferous sandstones and limestones outcrop around Burnmouth, while Chester Hill is capped by Upper Old Red Sandstone conglomerate.

The complex geology has led to a varied coastline in what is the most species-rich hectad in Berwickshire, despite its limited land area. Sadly the coast is ploughed almost to the cliffs except at St Abbs Head and on the Silurian rock nearby, so the botanical interest is largely on the sea braes and shores. Inland, the main features are the woodlands along the Ale and Eye Waters though there is grassland interest at Chester Hill and north of Millar's Moss.

Eymouth is the largest town in Berwickshire and there are villages at Ayton, Coldingham, St Abbs and Burnmouth. The harbour at Eyemouth has recently been enlarged and there is modest industrial development. There are small harbours at St Abbs and Burnmouth. The A1 trunk road and the mainline railway pass though the hectad.

Sites with at least moderately good habitat	GR - NT
Millar's Moss	9067, 9068
Coldingham Bay	9166
St Abbs Village, Northfield	9167, 9168, 9266, 9267
St Abbs Head NNR, Starney Bay	9167
St Abbs Head NNR, St Abbs Head	9168, 9169
St Abbs Head NNR, Petticowick	9068, 9069
West in Thirle, Broadhaven Bay	9068, 9069
Ayton, Ayton Castle, Eye Water	9260, 9261, 9361
Linthill, Ale Water near, Little Dean	9162, 9262, 9263
Old Linthill, Ale Water, Eye Water	9362, 9462
Eyemouth, Eyemouth Fort, Hairy Ness	9363, 9364, 9365, 9463, 9464, 9465
Killiedraught Bay	9364, 9465
Fleurs Dean, Linkim Kip	9165, 9264, 9265
Linkim Shore, Yellow Craig	9265, 9266, 9365
Chester Hill	9560
Burnmouth, south	9560, 9660
Burnmouth, north	9561
Fancove Head	9562
Gunsgreen	9464, 9563, 9564

Habitats

The **coast** provides the principal habitats of the hectad. In the southernmost section around Ross Point the cliffs are steep and inaccessible while above the houses at Ross there is much scrub. The ravine at Ross has lost some of its interest recently, including a flush with *Pinguicula vulgaris*, but there is *Equisetum telmateia* and *Eupatorium cannabinum*, the latter a widespread species on the sea braes. The braes north to Burnmouth are rich in *Hieracia* and *Origanum vulgare* is frequent.

The ravine below Burnmouth has crumbling slopes prone to slippages and is very species-rich but, alas, it is now dominated by *Cotoneaster* species and *Centranthus ruber* with sloes and whins also encroaching on the grassland. *Rubus caesius* is quite plentiful immediately behind the beach with *Ranunculus sceleratus* nearby, while *Sanguisorba minor*, *Viola hirta*, *Myosotis ramosissima* and *Valerianella locusta* survive as features of the slopes. The first two of these species are under threat from the intrusive neophytes while the last two struggle in the face of rabbit burrowing and grazing, though the rabbits do help to keep the habitat open. *Leontodon saxatilis* was thought to be present alongside the *Viola hirta* but it proves to be a small form of *L. hispidus*. Normal *L. hispidus* is plentiful on the braes not far away. A form of *Petroselinum crispum* with flat rather than crisped leaves is well naturalised here. Other herbal and cottage garden survivals include *Artemisia absinthium*, *Malva moschata* and *Smyrniolum olusatrum*. There is a good colony of *Geranium sanguineum* just beyond the houses at Partanhall, a rarity in Berwickshire but plentiful on the coast south of Berwick.

As the braes continue north the scrub is mainly sloe and is confined to the higher slopes. Below this there is splendid calcareous grassland with an abundance of *Primula veris* and *Orchis mascula* accompanied by *Carlina vulgaris*, *Helianthemum nummularium*, *Polygala vulgaris*, *Saxifraga granulata* and great masses of *Vicia sylvatica*. *Arabis hirsuta*, *Catapodium rigidum*, *C. maritimum*, *Thalictrum minus*, *Trifolium fragiferum* and *Viola canina* are present in small quantity with *Ligusticum scoticum* and *Triglochin maritimum* on the rocks at the shore. The vegetation changes abruptly where the Silurian rocks begin and the coast north is mainly inaccessible cliff. The bay just beyond Fancove Head has some accessible ledges where the calcareous grassland species reappear. The land drops away beyond Blaikie Heugh and on the slope past Horse Head there are small colonies of *Viola tricolor* in the grassland.

The coast south of Eyemouth, seaward of Gunsgreen, is varied and interesting with many small coves and low promontories. The Eyemouth Golf Course is adjacent and much good habitat has been lost over the years to agriculture and now to the fairways and greens. Fertiliser runoff onto the braes is an increasing issue. Nevertheless the botanical interest remains high. *Astragalus danicus* is scattered at

the cliff top, there is a tiny patch of maritime heath with a fine population of *Scilla verna*, one slope has a magnificent colony of *Viola canina* and wet places on the rocks harbour *Carex distans*, *Schoenus nigricans*, *Seriphidium maritimum*, *Spergularia media* and *Triglochin maritimum*. *Ligusticum scoticum* is widespread. However the new harbour wall has destroyed a rich shoreline where *Primula veris* and *Orchis mascula* were formerly plentiful and dumping has introduced a suite of neophytes, in particular *Allium paradoxum*, *Crocasmia x crocosmiflora* and *Sedum album*.

Eyemouth Fort occupies a promontory on the Old Red Sandstone to the north of the town and its turbulent history has ensured the destruction of any grassland interest. However the northwest side of the promontory is andesite and at the very tip stands Hairy Ness. Here there is a tiny amphitheatre where *Puccinellia distans* subsp. *borealis* is found in a largely vegetation-free area. Following the cliff northwest the slopes become less rocky and *Euphrasia tetraquetra* and *Centuarium erythraea* occur. Killedraught Bay lies just to the north again and for a modest length the sea braes are very species-rich with *Carlina vulgaris*, *Gymnadenia conopsea*, *Listera ovata* and other calcicoles. *Rosa rugosa* has recently naturalised here, forming an unwelcome thicket behind the shore below.

There is little habitat at the top of the cliffs at Linkim Kip, but *Primula veris* remains constant through to the foot of Fleurs Dean, where *Carlina vulgaris* also flourishes. Fleurs Dean itself is much given over to scrub and its botanical interest is declining, with *Cynoglossum officinale* one of the casualties. However small open flushed areas survive for the present where *Carex pulicaris*, *Dactylorhiza fuchsii*, *Gymnadenia conopsea* and *Pinguicula vulgaris* are found. Linkim Shore has been much botanised over the years so there is evidence that the interest of the sandy grassland behind the beach has declined. *Myosotis ramosissima* and *Valerianella locusta* just hang on but *Vicia lathyroides* was last seen in 1994 so its survival is more doubtful. There is a good show of bluebells in spring under the bracken on the slopes behind where a tiny colony of *Corydalis claviculata* was refound in 2010. Immediately to the north of Linkim Shore at Yellow Craig Head there is a complex of bays, promontories, saltmarsh and flushes of high botanical interest. Highlights are *Carex distans*, *C. extensa*, *C. otrubae*, *Eleocharis quinqueflora*, *Glaux maritima*, *Parnassia palustris*, *Pinguicula vulgaris*, *Spergularia media* and *Triglochin maritimum*. A wholly unexpected recent arrival is *Crambe maritima*. One plant has flourished on a small beach and flowered for the first time in 2009, it was joined by a seedling nearby in 2012. Another recent arrival is *Atriplex littoralis*, first seen in 2006.

Coldingham Bay has a sandy beach popular with holiday makers in the summer so the disappearance of *Cakile maritima* in the 1990's was attributed to them. This seems to have been a fallacy as the *Cakile* has now re-colonised in some

abundance. The frequency of *Atriplex* species, especially *A. laciniata*, is similarly variable. The modest dunes behind the beach with *Ammophila arenaria*, allegedly deliberately introduced to stabilise the sand, and *Leymus arenarius* are also home to a small colony of *Geranium sanguineum*, better colonies of *Carex arenaria* and *Thalictrum minus* and a large population of *Stellaria pallida* by the beach huts. The grass banks are no longer grazed and scrub is spreading, but *Primula veris* is still widespread. Homeli Knowe, a fort-like feature at the foot of Milldown Burn has a few *Gymnadenia conopsea* and many *Listera ovata* with *Helianthemum nummularium*, *Koeleria macrantha*, *Primula veris* and *Orchis mascula*. *Astragalus danicus* appears to have been lost since 1996. The *Anthyllis vulneraria* here formerly supported a colony of Small Blue butterflies, but these died out quite recently though another colony has been discovered near Eyemouth. The Milldown Burn has a small dean with woodland species including *Phyllitis scolopendrium*, which has probably increased recently. Behind the north end of the beach *Clematis vitalba* has naturalised in great abundance over bracken and other vegetation.

The cliffs to the immediate south of St Abbs village suffer from dumping and *Sedum album* in particular has colonised to excess, endangering a colony of *Trifolium arvense*, though this species is also present about the harbour. A small colony of *Daucus carota* at the foot of the cliffs is the sole extant native population known in Berwickshire and does not seem to relate to cultivars. It has a long recorded history in this neighbourhood.

Starney Bay, to the north of the village, marks the entrance to **St Abbs Head NNR**. It has related geology to the cliffs to the south of the village and *Trifolium arvense* is plentiful on the cliffs. There is a little *Astragalus danicus* on the cliff top and the slopes below have *Agrimonia eupatoria*, *Centaureum erythraea*, *Helianthemum nummularium* and *Orchis mascula*.

Ligusticum scoticum is plentiful on the north face of White Heugh where the geology changes to andesite. This geological fault properly marks the beginning of St Abbs Head, very much the Berwickshire Mecca of birdwatchers and botanists. The botanical interest is secondary to the sea birds and has been much modified over the centuries by settlement, cultivation, quarrying, the construction of a reservoir on the site of a mire and even a short-lived nine-hole golf course. In the circumstances it is perhaps remarkable that so much has survived with the main losses relating to maritime heath and mire communities. The key to the high survival rate is the hardness of the andesite and basalt, and their mineralogy is what favours the specialist plants of the head. While *Minuartia verna* is the most characteristic of these, with good colonies on inland cliffs at Kirk Hill and near Petticowick, the very extensive population of *Astragalus danicus* at the cliff edge and on the knowes with *Koeleria macrantha* as an associate is perhaps more

significant. Here they are accompanied by abundant *Armeria maritima* with *Silene uniflora* more restricted to the cliff edge. *Sagina subulata* has recently been discovered on an undistinguished knove not far from the old lighthouse and near a small colony of *Viola canina*.

The slopes below Kirk Hill and by Mire Loch have some notable annuals: *Anagallis arvensis*, *Catapodium rigidum*, *Myosotis ramosissima*, *Sherardia arvensis*, *Torilis nodosa*, *Trifolium striatum* and much *Vulpia bromoides*. Some of these annuals, the *Torilis* in particular, are threatened by the spread of *Sedum album*. The coastal rocks are very inaccessible but there are further populations of *Ligusticum scoticum* and a little *Catapodium marinum*. The cliffs on the northwest side of the old lighthouse have substantial but totally inaccessible colonies of *Sedum rosea*. At Petticowick the north end of the geological fault defining St Abbs Head is reached and Silurian rocks follow northwards. *Juncus ambiguus* occurs by a seepage on the beach where occasional plants of *Puccinellia distans* subsp. *borealis* may be found. This grass has its main colony on a sea stac in Broadhaven Bay nearby, with a little *Seriphidium maritimum*. Conversely, the main colony of the *Seriphidium* is on a boulder beach adjacent. The rocky slopes of Broadhaven Bay have good colonies of *Orchis mascula* and *Hyacinthoides non-scripta*, the latter being absent on the andesite. In the recesses of the bay by West in Thirle Heugh there are further colonies of *Sedum rosea*, some plants of which may be reached with care.

Inland from West in Thirle there are a series of rocky knowes across to Millar's Moss Reservoir. Most of the **inland grassland** here is fertilised and the botanical interest has suffered accordingly. *Stellaria pallida* remains frequent on the tops and *Cerastium arvense* is quite widespread on the lower slopes. *Filago minima* and *Geranium pusillum* are not faring well and *Filago vulgaris* has not been seen since 1983. Elsewhere inland grassland is rare. There are fragments of species-rich grassland on knowes by the Eye Water above the Victoria Jubilee Bridge near Ayton. Here *Carex muricata* subsp. *lamprocarpa* just survives with *Koeleria macrantha* but *Dianthus deltoides* appears to have been lost. *Malva neglecta* occurs here in two places and also in a number of other localities near the coast as an archaeophyte. It is often associated with *M. moschata* and *M. sylvestris*. In better condition is the grassland on rocks and a steep slope at Chester Hill near Burnmouth. Here a calcareous community occurs, not dissimilar to that on the sea braes below, with plentiful *Primula veris* and *Orchis mascula* and an unexpected colony of *Arabis hirsuta*. *Viola lutea* just survives in the remains of a more acid community on the hill top.

Wetland is almost limited to the two small reservoirs at Millar's Moss and Mire Loch. The former is notable for *Potamogeton filiformis* which has its headquarters in the nearby Coldingham Loch. There is also *Ranunculus peltatus*, *Zannichellia*

palustris and the charophyte *Chara globularis/virgata* agg. but the *Ranunculus baudotii* recorded in 1954 has never been found again and may have been casual. However *Littorella uniflora* has disappeared since 1994 so the water chemistry may have been changing. Mire Loch is much used by Kittiwakes for bathing and is not very species-rich, though the adjacent flushes have much *Dactylorhiza purpurella* and *Hydrocotyle vulgaris*. A taxon that survived the mire destruction, and may even have originated then, is *Equisetum x litorale*.

Woodland is mainly represented by the deans along the Ale and Eye Waters. Whitfield Wood by the Ale Water was formerly very wet woodland with moorland adjacent and had a specialist flora but only vestiges of these communities survive. The Ale Water has a long series of deep gorges with apparent botanical potential. The reality is rather disappointing. *Allium ursinum*, *Phyllitis scolopendrium* and *Polystichum aculeatum* are plentiful as are *Claytonia sibirica* and *Symphytum tuberosum* as introductions but more specialist woodland indicators like *Adoxa moschatellina* and *Sanicula europaea* are very scarce. Near the foot of the Ale Water the geology changes and *Geum rivale*, *Hypericum hirsutum* and *Saxifraga granulata* appear. Just at the junction with the Eye Water there is a remarkable rock outcrop, the Kip Rock. Here *Allium vineale* var. *compactum* and *Echium vulgare* are found. The steep banks opposite have an even more unexpected community with *Astragalus glycyphyllos* and *Thalictrum minus*. While the Eye Water both above this point to Ayton and downstream to Netherbyres has many pleasant wooded banks they are much modified by plantings and by intrusive neophytes such as *Allium paradoxum* and *Doronicum pardalianches*. There is *Cardamine amara* and a little *Campanula latifolia*. *Myrrhis odorata* and *Oenanthe crocata* are very frequent. *Berula erecta* occurs in an old mill stream. Some of the rocky banks have colonies of *Daphne laureola*, thought to be an introduction in Berwickshire, but a well-naturalised one. The few plants of *Carex pendula* at Netherbyres could be garden escapes as could the *Polystichum setiferum* nearby while *Tulipa sylvestris* is a well-naturalised introduction near the house. All the *Viburnum opulus*, especially evident around Eyemouth, is clearly planted.

Moorland is all but extinct in the hectad away from the few coastal fragments. Nevertheless a surprising number of moorland and moorland-edge species may be found in the Feuarsmoor, Mileknowe and Drill Plantations, Longueville and Whitfield Wood. There is a little *Calluna* with such species as *Achillea ptarmica*, *Carex disticha*, *C. flacca*, *Geum rivale*, *Rhinanthus minor* and *Trifolium medium*. *Rhinanthus* is a species in serious decline in Berwickshire and the colonies here are some of the best remaining in the county. The woodland rides are one of the few localities in Berwickshire where *Mentha arvensis* is still found, as it almost gone from arable fields.

The hectad has a relatively rich **arable weed** flora, especially in the fields adjacent to the coast, but it is now rare to see many plants of the scarcer species. *Anthriscus caucalis* has prospered briefly in two fields on Northfield in recent years but *Chrysanthemum segetum* has all but disappeared except in wildflower sowings. *Stachys arvensis* is occasionally met with at the headland by the coastal path and *Anagallis arvensis* is persistent in one field at Burnmouth where *Borago officinalis* has recently become naturalised where it had been grown as a crop. *Fumaria* species are well represented. *Fumaria purpurea* appeared in some profusion along a headland to the north of Eyemouth in 2000 and has been met with on disturbed ground elsewhere about the town. One plant of *F. bastardii* was seen in 2010 but *F. densiflora* has not been seen since 1981. *F. muralis* subsp. *boraei* and *F. officinalis* subsp. *officinalis* are widespread with *F. officinalis* subsp. *wirtgenii* occasional. *Lamium amplexicaule*, *L. confertum* and *L. hybridum* are all quite frequent.

The settlements have a variety of **ruderal habitats** with species of interest. Outside Coldingham there is a rocky knove at Coldingham Law with *Geranium pusillum* among the remnants of a grassland flora but there is also a colony of *Artemisia absinthium*, notable because it could be a survival from plants cultivated for medicinal purposes by the monks of Coldingham Priory. This species is also found in St Abbs and at least until very recently at Ross, below Burnmouth. *Epilobium roseum* is present in Coldingham, St Abbs and Eyemouth while *Coronopus squamatus* is a speciality of the Eyemouth area, being more often found around the town than in the fields, though it used to be frequent in field gateways at Gunsgreen before the golf course development. *Hordeum murinum* is almost restricted to the coastal strip in Berwickshire and occurs here and there around Coldingham, St Abbs and Eyemouth. *Fumaria capreolata* was found at the base of a wall in Eyemouth in 2010, a similar habitat to its one other Berwickshire locality at Cockburnspath. *Sagina maritima* occurs about the harbours of St Abbs, Burnmouth and Eyemouth and occasionally by roads. Eyemouth has been mentioned under a variety of habitat headings and, despite its predominately urban nature, its monad, NT9464, is the most botanically diverse in Berwickshire in terms of rare or scarce plant species with twenty-five such species present.

The roadsides have the usual halophytes but have been relatively little surveyed for other plants of interest. The railway has not been surveyed, but no banks worthy of particular attention have been noted. However *Ceterach officinarum* has a good colony on the lane leading to the old Ayton station.

Table of Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and Scottish Wildlife Trust reserves

Note

The monad (1km) GRs for the main sections of each site are listed below omitting some marginal monads

SSSIs and SACs

Abbey St Bathans Woods – Brush Wood and Godscroft Wood 7363, 7463, Bankend Wood 7562, Shannabank wood 7562, 7662, Butterwell Wood 7661, 7761, Retreat Wood 7760, Wild Wood 7760, Elba 7860, Aikyside Wood Junipers 7960, Aikyside Wood 7961

Airhouse Wood 4753

Bemersyde Moss 6032, 6132, 6133

Burnmouth Coast – Ramfaulds 9564, Scout Point 9563, Fancove Head 9562, Burnmouth Braes 9561, Burnmouth Harbour 9560, Ross 9660, Hilton Bay 9659, Lamberton Shiels, below 9658, 9758, Lamberton, English Border below 9757, Lamberton Undercliff 9757, 9758

Coldingham Loch 8968

Crook Burn East, Dyshaugh 6958, 6959

Drone Moss 8466, 8467

Gaitheugh (Gateheugh) – Leaderfoot 5734, Gledswood 5834, Gaitheugh (Gateheugh) 5933, 5934, Bemersyde, below 5833

Gordon Moss 6342

Greenlaw Moor – Dogden Moss 6749, 6849, 6949, Greenlaw Kaims 6850, 6950, 7050, 7051, Fangrist Burn 6949, 7049, Greenlaw Moor 7048, 7049, 7148, 7149, 7150, 7151, 7248, Hule Moss 7149, Kyles Hill 7249, 7250, 7251

The Hirsell – Dundock Wood 8039, 8040, 8139, 8140, Hirsell Lake 8240, The Hirsell, Leet Water at 8141, 8240, 8241

Langtonlees Cleugh 7352, 7452

Long Moss, Coldingham Common 8568

Lurgie Loch 6739

Pease Bay Coast – Ramsheugh Bay 7772, Cove 7871, Pease Bay (part) 7971

Pease Dean – Pease Dean, lower 7970, Pease Dean, upper 7969

St Abbs to Fastcastle – Midden Craig 8370, Rammel Cove 8470, Telegraph Hill 8570, Fast Castle 8670, Dowlaw Dean 8670, Lumsdaine Shore 8770, 8769, Westerside Dean 8869, Earnsheugh 8969, Petticowick 9068, 9069, St Abbs Head 9169, Kirk Hill 9168, Mire Loch 9168, Starney Bay 9167

Tweed River (the SAC, which is wider than the SSSI) – River Tweed, Whiteadder Water, Blackadder Water, Eden Water, Leader Water. (Does not include some burns such as Fangrist Burn 6948 outwith Greenlaw Moor SSSI. Eden Water and Leader Water are no longer in the SSSI. Does not include Eye and Ale Waters which are a separate catchment)

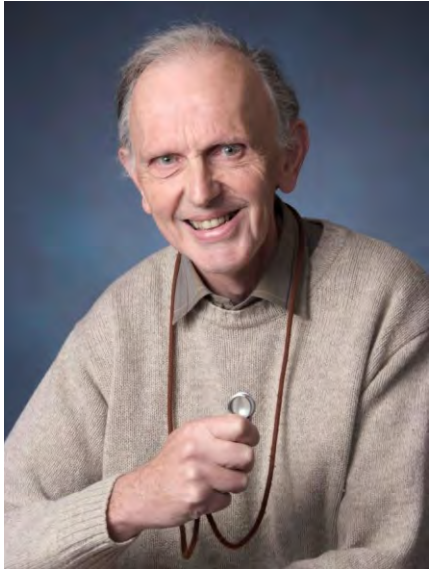
SWT Reserves not SSSIs

Duns Castle (reserve by agreement) – Witches Hill 7754, St Mary's Glade 7755, Hen Poo 7754, Colonel's Walk 7755, Mill Dam 7855

Pease Dean (part outwith SSSI owned by SWT) – Tower Dean 7869, 7870, 7970

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Clockwise from top left:
Vicia orobus site, Wrunklaw
Vicia orobus
 Michael Braithwaite
Astragalus danicus at cliff top by foot of Dowlaw Dean,
 looking east to St Abbs Head

Front cover:
 ‘Hareheugh Craigs’ by the late Jeanna Holl