

A SEARCH FOR *CHAENOTHECA GRACILANTA*
IN YORKSHIRE (VC62 & VC64) 2019



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Cover Photograph: Photos 2019-03-04-03: Nab End Wood, Kilton Beck, a post mature Wych Elm supporting high lichen interest, including *Ramonia chrysophaea* NT (NS/IR/S41), new to Vice-county, *Agonimia allobata* Nb (IR) and a sterile *Chaenotheca* species (bottom) with *Stichococcus* algae (top left), which is probably just a UV- form of *Chaenotheca furfuracea*.

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1.0 INTRODUCTION

1.1 Background & Brief

1.1.1 Background

Chaenotheca gracilenta is a rare pinhead found on decaying less-acid lignum of large broken trees and stumps and associated soil and rocks, in boreal and continental climates. In Britain it has mainly been recorded on old Elm trees, with one record from Scotland on a Sycamore. The species has always been rare in Britain, recorded from a total of two 10km grid squares in England and five 10km grid squares in Scotland. The dependence on old Wych Elms, however, has led to this species being highly threatened by Dutch Elm Disease in Britain. As a result, this Nationally Rare lichen was assessed as Endangered by Woods & Coppins (2012) and was also listed as a Biodiversity Action Plan species and was later added to Section 41 of the of The Natural Environment and Rural Communities (NERC) Act.

In England the lichen has been recorded from two sites in the north east of England, where it was last recorded in 1976 at one and 1977 at the other.

1.1.2 Brief

As part of the National Lottery Heritage Fund funded Back from the Brink project, Plantlife contracted Neil Sanderson, Botanical Survey & Assessment, to visit the two sites where *Chaenotheca gracilenta* had been recorded from England and to search for the lichen, record it if found and assess the current suitability of the habitat for the potential survival of the species if not.

2.0 METHODS

2.1 Survey Methods

2.1.1 Timing & Conditions

The visit to both sites were on 4th and 5th March 2019. The weather was mainly dry, with the tree bark moist to dry.

2.1.2 Old Data

The previous record for *Chaenotheca gracilentia* were supplied by Janet Simkin, data officer for the British Lichen Society. There were two sites: the Kilton Beck woods near Loftus in VC62 North-east Yorkshire (modern Cleveland) (NZ7015 - Z7018), and Fountains Abbey, Ripon, VC64 Mid-west Yorkshire (SE278683).

Mark Seaward also provided a check list of the lichens recorded previously from Fountains Abbey (Seaward, 2013).

2.1.3 Areas Surveyed

The survey routes are shown on **Maps 1 & 9**, derived from the route as recorded by the GPS receiver.

2.1.4 Recording

Where this was ascertainable, the area around the previous location for *Chaenotheca gracilentia* was searched, but also any potentially suitable habitat in the area was also looked at. The density of interest found determined the intensity of the survey, with most trees looked at in the richest areas.

During the search other lichens encountered were also recorded. All species found were recorded to a minimum resolution of a six-figure national grid reference when first encountered. Further occurrences of species of interest were recorded at least to at least six-figure grid reference accuracy. RDB species and other species of high interest were recorded to 8 or 10-figure accuracy. The locations of trees of particular interest supporting rare species which were recorded systematically were located as waypoints using a Garmin GPSmap 64s (**Maps 2 & 8**). The systematically recorded species were all Near Threatened or above (Woods & Coppins 2012) otherwise and a selection of the more significant Notable species.

The systematically recorded species were:

Kilton Beck, Loftus

Agonimia allobata Nb (NS)
Agonimia flabelliformis Nb (NR)
Inoderma subabietinum Nb (IR)
Ramonia chrysophaea NT (NS/IR/S41)

Fountains Abbey

Bacidia incompta VU (NS/S41)
Chaenotheca chlorella NT (NS)

Chaenotheca stemonea Nb (NS)
Chaenothecopsis nigra Nb (NS)
Chaenothecopsis pusilla Nb (NS)
Lecanora sublivescens NT (NS/IR/S41)

The codes used for the waypoints were KB for Kilton Beck and FAB for Fountains Abbey and then a sequential waymark number, e.g. KB01 etc. & FAB01. The data on the GPS recorder was downloaded to Garmin BaseMap software and manipulated in this software. The final data was then exported as GPX files to the GIS application QGIS 3.4, where the data was mapped on a georeferenced raster format map, in this case the royalty free 1:2,500 OS base map with vector contours.

For each tree recorded, the tree species, physiological age and habitat was noted. Photographs were taken of some of the more significant trees, which are included in **Annex 1**. The site notes were made on an iPhone in the field and the field notes have been edited and added to the report as **Annex 1**. The species recorded are given in **Species Lists 1 – 2, Annex 2**.

2.1.5 Trees

The terms used to describe the physiological age of the tree are explained below. These are based on Harding & Alexander (1993):

- Mature: a tree that has reached its full height and is still vigorous, heart rot likely to be absent.
- Post mature: a tree that is no longer vigorous and has started retrenching by branch die back. Heart rot will have commenced but will not be easily visible.
- Ancient: a tree with major branch die back and or extensive and visible heart rot.

The term 'veteran tree' is taken to include both post mature and ancient trees. This classification reflects the natural processes that older trees go through as a response to balancing their increasing size with the photosynthetic area available. The commencement of heart rot indicates the end of the commercial usefulness of timber trees and, in managed woodlands such trees, and their associated biodiversity, are likely to be rare features.

2.2 Data Analysis

2.2.1 Nomenclature

The nomenclature mainly follows Woods & Coppins (2012) for lichens and lichenicolous fungi but includes changes accepted by the BLS taxon dictionary since then <<http://www.britishlichensociety.org.uk/resources/lichen-taxon-database>>. New names added since Woods & Coppins (2012) and used in this report are listed below:

New Name	Old Name
<i>Aquacida viridifarinosa</i>	<i>Bacidia viridifarinosa</i>
<i>Dendrographa decolorans</i>	<i>Schismatomma decolorans</i>
<i>Inoderma subabietinum</i>	<i>Lecanactis subabietina</i>
<i>Myriolecis dispersa</i>	<i>Lecanora dispersa</i>
<i>Myriolecis hagenii</i>	<i>Lecanora hagenii</i>

*Myriolecis sambuci**Lecanora sambuci*

2.2.2 Ancient Woodland Indicators

The ancient woodland indicator lists and the assessment of lichen assemblages follows Sanderson et al (2018). The main relevant indices referred to are the Sub-oceanic Index (SWI) (formerly the East of Scotland of Ecological Continuity, ESIEC) and the Pinhead Lichen Index (PLI) but the Southern Oceanic Woodland Index (SOWI) (formerly the New Index of Ecological Continuity, NIEC) is included due to the presence of several southern oceanic species at Kilton Beck, Loftus.

In this area the threshold for SSSI quality for the Sub-oceanic Index (SWI) is 15 or more, while the same threshold for the Pinhead Lichen Index (PLI) is 10.

2.2.3 Rarity & Threat

Assessments of Red Data Book status and International Responsibility species follows Woods & Coppins (2012) and Sanderson et al (2018), while Nationally Rare and Nationally Scarce are as listed by Sanderson et al (2018).

Many lichens species recorded as Nationally Rare and Nationally Scarce are actually under recorded widespread species. A recent report Sanderson (in press) has reviewed the list of Nationally Rare and Nationally Scarce, which are neither Near Threatened or higher Red Data Book species or International Responsibility species. Species Nationally Rare and Nationally Scarce which are under recorded species of no conservation interest, or which are widespread ruderal species were excluded from a list of Notable species. The final Notable species list included all Nationally Rare, Nationally Scarce and International Responsibility species of conservation interest that were not Near Threatened or higher Red Data Book species. The Notable species are listed in Sanderson et al (2018).

The former BAP list (Biodiversity Reporting and Information Group, 2007) provided the basis of the lichens listed under Section 41 of the Natural Environment & Rural Communities (NERC) Act 2006. Species on this list are considered to be of "principal importance for conservation of biological diversity in England".

Abbreviations used in the text and tables are listed below:

- VU = Vulnerable Red Data Book species
- NT = Near Threatened Red Data Book species
- Nb = Notable species (NR, NS, or IR species of conservation significance not RDB NT or higher)
- NR = Nationally Rare
- NS = Nationally Scarce
- IR = International Responsibility species
- S41 = Section 41 species
- (NS) = Nationally Scarce species not regarded as a Notable species; an under recorded or ruderal species of limited conservation significance

3.0 **CHAENOTHECA GRACILENTA SURVEY**

3.1 **Kilton Beck, Loftus**

3.1.1 **Site and Old Records**

The site is a woodland within a 6km long ravine cut into the northern side of the North York Moors (**Map 4**). It is clearly an ancient woodland and, from what was seen during the survey, contains well developed examples of the Habitats Directive Annex 1 Priority Habitat "Tilio-Acerion forests of slopes, screes and ravines", including widespread native Small Leaved Lime. The woodland is likely to have been mainly managed by coppicing in the past, but the survey found some areas of developing old growth in the least accessible areas. The wider area was largely rural in the 1850s (**Map 4**), but massive industrialisation of Cleveland occurred afterwards, with iron mining and the associated railways impacting the seaward end of the ravine. The woodland will have been badly acidified by air pollution in the late 19th and 20th centuries. That any lichen interest survived at all that close to the Teesmouth industrial complex is somewhat surprising, but must be due to the shelter provided by the deep ravine.

BLS mapping data indicates that there is an interesting survival of southern oceanic species in the ravines in this area, including *Agonimia allobata* Nb (NS), *Inoderma subabietinum* (*Lecanactis subabietina*) Nb (IR) and *Lecania chlorotiza* NT (NS/IR/S41), although none of these had been recorded from the Kilton Beck ravine previously. All of these are confined to these ravines in the region. *Chaenotheca gracilentata* has been recorded once by Peter Earland-Bennett, Brian Coppins and Chris Hitch, as "Loftus - Kilton Beck Wood (NZ71)" 04/12/1976, with the comment "RDB L658 & Tibell det. sheets in BJC's files: On soil on underside of *Ulmus glabra*". No accurate location is given but the area surveyed was possibly indicated as NZ7015(-8), that is NZ7015 - NZ7018. If rights of way were used, this would be about 3.5km of woodland from Clarkson's Wood in the north to Mill Balk Wood in the south.

3.1.2 **The Survey**

The ravine was searched from the north. White Cliff Wood north of the large railway embankment is of low interest. To the south Clarkson's Wood is a steep sided ravine woodland with young to mature Sessile Oak, Sycamore and Ash with thin Hazel under storey with Holly. There is also Maple, Poplar, Alder and Wych Elm regrowth. The bark on most trees was rather bare, with limited lichen colonisation, presumably reflecting past acidification. Northern area looks quite disturbed with quarrying/tipping associated with the former adjacent iron mine. The ravine is not disturbed further up. Deeper in there are some surviving coppiced Wych Elm trees not impacted by Dutch Elm Disease. These Elm stools were not particularly promising habitats for *Chaenotheca gracilentata*, with small stools and only mature trunks. There were also increasing numbers of Small Leaved Lime trees growing from coppice stools appearing. In the south of Clarkson's Wood the lichen interest begins to pick with *Aquacida viridifarinoso* on a giant Small Leaved Lime stool and a broken Wych Elm and the old woodland pinhead lichen *Chaenotheca trichialis* on an old Oak.

South of a bend into Nab End Wood there was a marked change in the woodland. The very steep slopes include small cliffs and the woodland develops old growth characteristics, with post mature Ash and Sycamore to the north with some old

Wych Elm and more post mature Oak to the north. There was significant lichen interest here. In the more base-rich woodland to the north, the old Elm were particularly important. Two of these (**KB01 & KB02, Map 2**) supported *Ramonia chrysophaea* NT (NS/IR/S41), new to the vice-county and the first modern record for north east England. The first also had *Agonimia allobata* Nb (NS) and a sterile leprose green crust with *Stichococcus* algae, which was certainly a *Chaenotheca* species and could possibly have been *Chaenotheca gracilentia*. This is discussed in more detail in section 3.1.3. Other species of interest in this area included *Enterographa hutchinsiae* on a dead Wych Elm stump and *Porina byssophila* Nb (NS) on Sycamore. Further south old Oak become more frequent (**KB03 – KB09, Map 2**) and supported *Agonimia flabelliformis* Nb (NR), *Eopyrenula grandicula* Nb (NS/IR) on Hazel, both new to northern England, and *Inoderma subabietinum* Nb (IR) on Oak. Additional species of interest here were *Aquacida viridifarinosa* on Oak, *Chaenotheca trichialis* on Oak, *Enterographa crassa* on Oak and *Thelotrema lepadinum* on Oak, Ash, Hazel and Small Leaved Lime. At the southern boundary of the area of interest a third tree with *Ramonia chrysophaea* NT (NS/IR/S41) was found, this time on a Sycamore (**KB010**).

To the south into Cabin Hole Wood the wood is dominated by mature Ash with Wych Elm, with no veteran trees, and was clearly less interesting for lichens. The survey was carried on to the south but was stopped after no more lichen interest was found

3.1.2 *Chaenotheca gracilentia*

Potential *Chaenotheca gracilentia* was found on a veteran Elm (**KB01**). This was a sterile thallus, with a bright green loose leprose thallus, with *Stichococcus* algae which was UV -, Pd - and Pd/UV -. The leprose thallus with *Stichococcus* suggests *Chaenotheca furfuracea*, *Chaenotheca stemonea* Nb (NS) or *Chaenotheca gracilentia* EN (NR).

Chaenotheca furfuracea: should be UV± lemon-yellow or pale orange. Is not clear if it is it always UV +. It is a possible species to be found on the dry bark of an Elm.

Chaenotheca stemonea: this should be PD + yellow but the reaction can be difficult to see, but using UV light makes it much easier to detect a reaction. In this case no Pd reaction was detected, including with UV. This species is also unlikely to be found on the dry bark of an Elm.

Chaenotheca gracilentia: matches in reactions, but most sources describe the thallus as greyish green and internet pictures do show a darker thallus than was found. Positives were that it was growing on Elm, its main habitat, and *Chaenotheca gracilentia* has been recorded from this site previously. Selva (2014) is clear, however, that the colour of the thallus of *Chaenotheca furfuracea* and *Chaenotheca gracilentia* are quite different with the former intensely yellow-green (as was this thallus) and the latter greyish-green.

As such it is most likely that the material on the tree was *Chaenotheca furfuracea* but with a UV - thallus. An earth bank about 20m away had a mixture of a similar thallus which was partly UV + orange and partly negative.

There are still veteran Elms surviving in this ravine, so it is possible that *Chaenotheca gracilentia* still survives somewhere in the ravine. There were steeper slopes on the OS map and wider crowned trees visible on Google Earth at Mill Balk Wood

(NZ701158), which may also have suitable habitat. This area appears to have been within the area visited in 1976 but was too far to be reached during this survey.

3.2 Fountains Abbey & Studley Park

3.2.1 Site and Old Records

Fountains Abbey and the contiguous Studley Park are important historical sites, with an ancient medieval deer park at Studley Park and modern landscape park based around the ruins of large medieval monastery at Fountains Abbey (**Map 11**). The site has long been known as an important lichen site. A list compiled by Seaward (2013) includes 19th century records of old growth or veteran tree dependent species which are now long gone. These include *Calicium quercinum*, now extinct in Britain and *Lobaria pulmonaria* Nb (IR), *Lobaria scrobiculata* Nb (IR) and *Lobaria virens* Nb (IR), which are regionally extinct. These losses were due to acidifying pollution in the later 19th to 20th centuries. There was still a significant assemblage of species of interested recorded at the latter part of the 20th century but has been no or limited lichen recording this century in the park. Some of the interest was recorded on Elm trees before Dutch Elm Disease arrived.

Chaenotheca gracilentata EN (NR) was one of these species recorded on Elm. A single record was made by Peter Earland-Bennett and Peter Lambley on 09/06/1977. This was recorded as “on shaded base of Elm” at SE278683, that is east of Robin Hood’s Well on the south side of the landscape park at Fountains Abbey.

3.2.2 The Survey

The survey covered both the landscape park around the *Chaenotheca gracilentata* EN (NR) record and the deer park of Studley Park, with part of Studley Park looked at first before the gardens opened. After the landscape park was searched then another transect made though Studley Park.

The landscaped gardens where *Chaenotheca gracilentata* was recorded, lack the very old trees of the deer park and had a different lichen assemblage. They lack the rarities of veteran trees and dead wood seen in the park in 2019 but did support an interesting assemblage of species of less-acid bark and some woodland species. The area where *Chaenotheca gracilentata* was recorded was a shelter belt in the southern edge of the landscape garden. Wych Elm was present but most stools were dead, with only a few surviving and re-growing. The surviving Elm stools were small and did not look suitable for *Chaenotheca gracilentata*. The shelter-belt and adjacent trees did support some lichen interest, mainly on Sycamore but also Oak and Lime. These included new vice-county records for *Aquacida viridifarinosa*, *Porina byssophila* and *Strigula taylorii* Nb (NS/IR), the old woodland species *Arthonia vinosa*, *Chaenotheca trichialis* and *Thelotrema lepadinum* and the first recent record of *Bacidia rubella*. Beyond this area, in the landscape gardens, *Myriolecis sambuci* and *Psoroglaena stigonemoides* were recorded on Elder and were also new to the vice-county. Also more *Chaenotheca trichialis* and *Thelotrema lepadinum* were recorded on both Oak and Sycamore.

In Studley Park, there are frequent groves of veteran Sweet Chestnut and Oak along with scattered trees, also some veteran Lime, Sycamore and Field Maple. The dominant veteran Sweet Chestnut and Oak were mainly very species poor due to the impact of past acidifying air pollution, however, a scatter of richer trees were found. Dry bark and dead wood were the main habitats of interest on the veteran Sweet

Chestnuts and Oaks. On Oak and Sweet Chestnut interest included new vice-county records of *Chaenothecopsis nigra* Nb (NS), *Chaenothecopsis pusilla* Nb (NS), *Chaenotheca stemonea* Nb (NS/IR) and *Lecanora sarcopidooides* Nb (NR). The latter was new to northern England and the second modern English record and is a significant record of a dead wood specialist, which is rarely recorded throughout Europe. Other Pinhead fungi of interest found on these trees include *Chaenotheca brachypoda*, *Chaenotheca chrysocephala*, *Chaenotheca hispidula* Nb (NS) and *Chaenotheca trichialis*.

A few important Lime trees and one Maple were found but these are very important. One lime (**FAB02**) supported *Lecanora sublivescens* NT (NS/IR/S41), new to the vice-county and the most northerly British record. Another broken ancient Lime (**FAB03**) supported *Chaenotheca chlorella* NT (NS) and *Chaenothecopsis pusilla* Nb (NS) on lignum, the former new to the vice-county and northern England. A hollow Maple (**FA09**) also supported *Bacidia incompta* VU (NS/IR/S41) on lignum, the first recent record from the park and north east England of this former Elm specialist. Other species of interest on Lime included new vice-county records for *Pertusaria flavida*, *Physconia perisidiosa* and *Opegrapha viridipruinosa*, along with the first recent vice-county record for *Bacidia rubella*.

3.2.2 *Chaenotheca gracilentata*

The loss of old Elms in the woodland has eliminated the habitat of *Chaenotheca gracilentata* EN (NR) from Fountains Abbey. There are suitable looking ancient Limes in Studley Park, but these are in the open and *Chaenotheca gracilentata* is solely a woodland species in Britain.

4.0 DISCUSSION

4.1 Kilton Beck, Loftus

4.1.1 *Chaenotheca gracilentia*

Although sterile thalli of a farinose *Chaenotheca* species was found on a veteran Wych Elm, the bright yellow thallus colour suggest that, on the balance of probabilities this was just a UV- form of *Chaenotheca furfuracea*. The survival of veteran Elms within this ravine woodland, however, means that the survival of *Chaenotheca gracilentia* EN (NR) cannot be ruled out.

4.1.2 Conservation Value

The Kilton Beck ravine woodland is not an SSSI but has a fine example of the Annex 1 Habitat "Tilio-Acerion forests of slopes, screes and ravines". There is a significant lichen assemblage in areas of old growth woodland on steep slopes. The ravine supports an SSSI quality population of *Ramonia chrysophaea* NT (NS/IR/S41), and a regionally significant assemblage of southern oceanic lichens at the edge of their ranges, with *Agonimia allobata* Nb (NS), *Agonimia flabelliformis* Nb (NR), *Eopyrenula grandicula* Nb (NS/IR) and *Inoderma subabietinum* Nb (IR) recorded in 2019 (Map 3). This assemblage is shared with other ravines in the area but there has apparently been no recent lichen surveys of these.

4.1.3 Management

The lichen-rich older stands on steep slopes appear to be self-sustaining under the current conditions. Other than ensuring they are not disturbed or felled, there appear no pressing issues. Ash Dieback will likely impact on the ravines but in the area looked at, Sycamore is actually more important for lichens at present than Ash.

4.1.4 Future Work

The ravine woodlands here, both in Kilton Beck and any others with areas of surviving old growth stands, are certainly worthy of further lichen survey. There is some potential for *Chaenotheca gracilentia* to survive and a regionally significant assemblage was found during a short visit, including the only recently recorded population of *Ramonia chrysophaea* NT (NS/IR/S41), a section 41 species and a selectable species for SSSI notification.

4.2 Fountains Abbey & Studley Park

4.2.1 *Chaenotheca gracilentia*

There seems little chance that *Chaenotheca gracilentia* EN (NR) survives here. Only small stools with young regrowth of Wych Elm survive at the original site.

4.2.2 Conservation Value

The site is not notified as an SSSI, however, although it is unlikely that *Chaenotheca gracilentia* survives, the veteran trees of Studley Park are of high significance for their lichen assemblage (Map 10). The assemblage recorded from the transects in 2019 included two selectable species for SSSI notification: *Bacidia incompta* VU (NS/S41) and *Lecanora sublivescens* NT (NS/IR/S41) and the Pinhead Index (PHI) scores 10, just reaching the threshold for SSSI quality. Excluding *Chaenotheca gracilentia*, four other species in the PHI have been recorded in the latter part of the 20th century and are likely to be still present, giving a potential score of 14. Also recorded in 2019 was

Lecanora sarcopidoides Nb (NR), a rare species in Europe. Studley Park is likely to be of SSSI quality for lichens within its Area of Search, and is also likely to be of high value for other veteran tree biodiversity.

4.2.3 Management

The parkland is well managed as far as was seen during the visit. Maintaining low intensity agriculture within the park, and ideally in adjacent land, will be important to reduce nitrogen pollution, which appeared quite high. Long term tree-planting will be required to maintain the veteran tree habitat.

4.2.4 Future Work

Studley Park is clearly an important site in a Yorkshire context for lichens and supports species and assemblages of national significance. Further survey to full characterise the surviving lichen interest of the veteran trees is highly desirable. Further target searches for *Chaenotheca gracilentata* are, however, not recommended.

5.0 REFERENCES

- Harding, P. T. & Alexander, K. N. A. (1993) The saproxylic invertebrates of historic parklands: progress and problems. In: *Dead Wood Matters: the Ecology and Conservation of Saproxylic invertebrates in Britain* (ed. K. J. Kirby & C. M. Drake) 58 - 73. Peterborough: English Nature.
- Sanderson, N.A. (in press) *The development of TNTN lichen assemblage scoring*. A report by Botanical Survey and Assessment for Natural England.
- Sanderson, N. A. Wilkins, T., Bosanquet, S. & Genney, D. (2018) *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 13 Lichens and associated microfungi*. Joint Nature Conservation Committee 2018: Peterborough <jncc.defra.gov.uk/page-2303>
- Seaward, M. R. D., (2013) *Preliminary Checklist of Fountains Abbey and Studley Royal Lichens*. Unpublished paper
- Selva, S. B. (2014) The calicioid lichens and fungi of the Acadian Forest Ecoregion of northeastern North America, II. The rest of the story. *The Bryologist*. **117**: 336–367
- Woods, R. G. & Coppins, B. J. (2012) *Species Status No. 13 A Conservation Evaluation of British Lichens and Lichenicolous Fungi*. Peterborough: JNCC.

ANNEX 1 Field Notes**Key:****General**

Coll. = Collected to confirm identity. Herb. = Collected specimen retained in author's herbarium. fr. = fertile.

Substrates

Ac = Field Maple, Al = Alder, Ap = Sycamore, Co = Hazel, Cs = Sweet Chestnut, Fx = Ash, Pp = Poplar, Q = Oak, Sx = Sallow, Ti = Common Lime, Tic = Small Leafed Lime, Ug = Wych Elm, L = Lignum (as prefix), Tw = twigs & branches & SSd = Sandstone & Terr = Terricolous.

Species in bold = systematically recorded species

Recent Synonyms

New Name	Old Name
<i>Aquacida viridifarinosa</i>	<i>Bacidia viridifarinosa</i>
<i>Bacidina delicata</i>	<i>Bacidia delicata</i>
<i>Inoderma subabietinum</i>	<i>Lecanactis subabietina</i>
<i>Myriolecis dispersa</i>	<i>Lecanora dispersa</i>
<i>Myriolecis hagenii</i>	<i>Lecanora hagenii</i>
<i>Myriolecis sambuci</i>	<i>Lecanora sambuci</i>

A1 Loftus, Kilton Beck 4/3/2019**A1.1 Weather**

Dry patchy thin cloud, with tree bark dry to moist from previous rain

A1.2 Clarkson's Wood**NZ7018**

Steep sided ravine, Young to mature Sessile Oak, Sycamore, Ash with thin Hazel under storey with Holly. Also Maple, Poplar, Alder and Wych Elm regrowth. Bark on most trees rather bare. Northern area looks quite disturbed with possible quarrying/tipping. Not disturbed further up.

NZ7018

East bank

<i>Arthonia didyma</i>	Ap
<i>Arthonia spadicea</i>	Al
<i>Cladonia humilis</i>	Pp
<i>Melanelixia glabratula</i>	Ap
<i>Trapeliopsis pseudogranulosa</i>	Al

NZ7066 1819

West Bank

Porina byssophila Ac Coll. Involucrellum purple-brown, K + blue-grey; three septate spores; clustered perithecia.

Dendrothele acerina Ac

NZ706 181

West Bank

Earth bank above river

Psilolechia lucida

Terr

East bank

Cliostomum griffithii

Ap, Fx

Lecanora expallens

Ap

NZ7017

Occasional older Wych Elm stems on coppice stools (**Photo** 2019-03-04-01 NZ7067 1793).



Photo 2019-03-04-01: Clarkson's Wood, Kilton Beck, a Wych Elm grown from a stool in the centre.

NZ706 179

Other Species

Arthonia spadicea

Ug, Tic

NZ705 177

NZ7058 1770 ancient Small Leaved Lime stool on steep bank, lots of overhang habitat on stool.

NZ705 176

NZ7058 1763 giant Small Leaved Lime stool by river on the west bank, **Photo** 2019-03-04-02. Above is broken Wych Elm trunk with regrowth

Aquacida viridifarinoso Ti, LTic, Ug
Opegrapha ochrocheila LTi, Ug



Photo 2019-03-04-02: Clarkson's Wood, Kilton Beck, a giant Small Leaved Lime stool by river on the west bank.

NZ705 176

West Bank

Species of Interest

Chaenotheca trichialis

LQ NZ7058 1765 cliff Sessile Oak

Other Species

Aquacida viridifarinoso

Al, Ap, Tic, LTic, Ug

Graphis scripta

Co

Lecanactis abietina

Q

Opegrapha ochrocheila

LTic, Ug

East bank

Species of Interest

Arthonia spadicea

Tic

Micarea prasina s. str.

LQ Stump NZ70573 17621. Dark coloured apothecia; polarising crystals only in epithecium and thallus. Herb. Sanderson 2576

A1.3 Nab End Wood to Cabin Hole Wood

Nab End Wood has steep slopes with cliffs and includes older Ash and Sycamore some old Wych Elm, with old Oak to the south producing stands of old growth ravine woodland. Significant lichen interest present here.

KB01 (NZ70457 17452, 68m): old Wych Elm on steep slope

Agonimia allobata

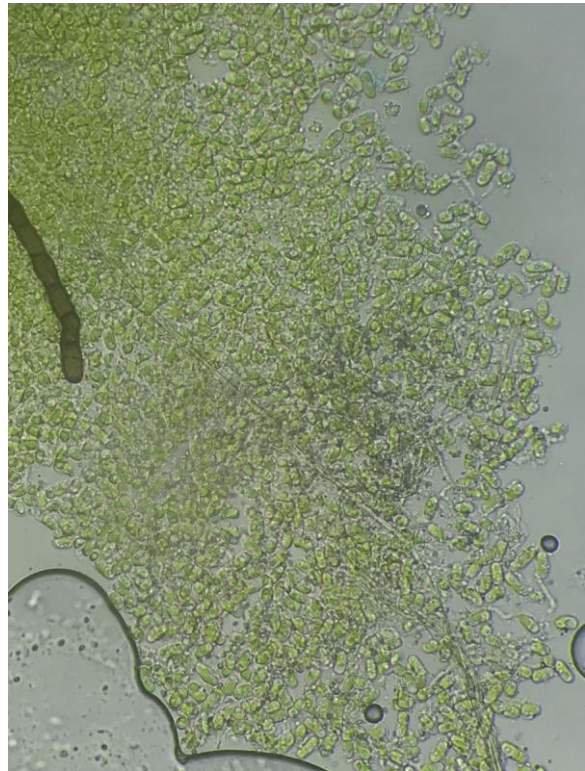
Ug Coll. O Muriform spores 35 x 15µm. Herb. Sanderson 2573

Ramonia chrysophaea

Ug Coll. F Spores 38 – 48 x 4µm. New to VC62, Herb. Sanderson 2572. New to Vice-county.

Chaenotheca furfuracea/*C. gracilentia*? Sterile with *Stichococcus* algae, UV –, Pd –, loose leprose thallus, bright green. Herb. Sanderson 2574

Photo 2019-03-04-03, 6 & 7





Photos 2019-03-04-03, 6 & 7: Nab End Wood, Kilton Beck, top left, a post mature Wych Elm supporting high lichen interest, including *Ramonia chrysophaea* NT (NS/IR/S41), new to Vice-county, *Agonimia allobata* Nb (IR) and a sterile *Chaenotheca* species (bottom) with *Stichococcus* algae (top left), Pd – and UV –. This is either an odd form of UV – *C. furfuracea* or sterile *C. gracilis* EN (NR/S41). The thallus of the latter is not usually so bright green.

KB02 (NZ70443 17459, 61m): next Wych Elm south of KB01

Ramonia chrysophaea Ug R

NZ704 174

Species of Interest

<i>Agonimia allobata</i>	Ug
<i>Chaenotheca furfuracea</i>	Terr NZ7046 1745 earth bank UV + orange, also associated UV – material
<i>Enterographa hutchinsiae</i>	Ug NZ7046 1745 dead Wych Elm stump
<i>Porina byssophila</i>	Ap NZ7043 1746
<i>Ramonia chrysophaea</i>	Ug

Other Species

<i>Anisomeridium polypori</i>	Ap, Ug
<i>Aquacida viridifarinosa</i>	Ug
<i>Arthonia radiata</i>	Fx Tw
<i>Chaenotheca furfuracea</i>	Terr
<i>Cladonia coniocraea</i>	Fx
<i>Cliostomum griffithii</i>	Ap
<i>Lecania cyrtellina</i>	Fx Ash on cliff NZ7040 1742 Coll. Spores 9 – 12 x 2.5 – 3µm, mainly simple. First modern record for VC65
<i>Lecanactis abietina</i>	Fx
<i>Lecania naegelii</i>	Fx Tw
<i>Lecidella elaeochroma</i> f. <i>elaeochroma</i>	Fx Tw
<i>Melanelixia subaurifera</i>	Fx Tw

<i>Opegrapha ochrocheila</i>	LFx, Ap
<i>Opegrapha vermicellifera</i>	Ug
<i>Parmelia sulcata</i>	Fx Tw
<i>Phlyctis argena</i>	Ap, Ug
<i>Physcia adscendens</i>	Fx Tw
<i>Physcia tenella</i>	Fx Tw
<i>Xanthoria parietina</i>	Fx Tw

NZ703 174

More acid to south with mainly old Sessile Oak but these start to get interesting

KB03 (NZ70370 17441, 45m): leaning Sessile Oak on ravine slope

Agonimia flabelliformis Q F Finely divided squamulose thallus; spores muriform 30 – 32 x 10µm. Herb. Sanderson 2575. New to Northern England.

Photo 2019-03-04-04



Photo 2019-03-04-02: Nab End Wood, Kilton Beck, a leaning Sessile Oak on a ravine slope with *Agonimia flabelliformis* Nb (NR), new to northern England.

NZ703 174**Species of Interest**

Agonimia flabelliformis Q

Other Species

Anisomeridium polypori Q

Micarea viridileprosa Q New to VC62

NZ703 173**Species of Interest**

Thelotrema lepadinum Fx, Q

Other Species

Cladonia coniocraea AI
Opegrapha calcarea SSd

To the south, more old Oaks of interest

NZ702 172

Species of Interest

Enterographa crassa Q NZ7029 1727

NZ703 172

Species of Interest

Micarea viridileprosa LQ

Thelotrema lepadinum Tic

Other Species

Lecanactis abietina Tic

NZ702 173

KB04 (NZ70297 17353, 61m): ancient Sessile Oak stool on cliff

Inoderma subabietinum Q F K/UV + Mauve on thallus &
Yellow on pycnidia

Also

Chaenotheca trichialis Q

KB05 (NZ70268 17352, 55m): post mature Sessile Oak on rock

Inoderma subabietinum Q, LHe

Thelotrema lepadinum Q

KB06 (NZ70274 17326, 58m): two Sessile Oak in top of bank

Inoderma subabietinum Q

KB07 (NZ70280 17329, 64m): leaning Sessile Oak in shelf on slope

Inoderma subabietinum Q

Also

Enterographa crassa Q

Porina aenea Q Coll.

KB08 (NZ70282 17305, 68m): Sessile Oak on slope

Inoderma subabietinum Q

NZ702 173

Species of Interest

Chaenotheca trichialis Q

Enterographa crassa Q

Inoderma subabietinum Q

Thelotrema lepadinum Q, Co

Other Species

Aquacida viridifarinoso Q

NZ702 172

KB09 (NZ70273 17299, 83m): post mature Sessile Oak on slope

Inoderma subabietinum Q

Also

Aquacida viridifarinoso Q

NZ702 172

Species of Interest

Inoderma subabietinum Q

Other Species

Aquacida viridifarinoso Q

Pyrrhospora quercea Q

Arthonia spadicea Q

NZ702 171

To south into Cabin Hole Wood the wood is dominated by mature Ash with Wych Elm, no veteran trees, less interesting

Lecania cyrtellina

Fx, Ug Coll. NZ7022 1718 Coll. Spores 9 - 12
x 2.5 - 3µm simple, apothecia pale and sessile.
Herb. Sanderson 2577. First recent vice-county
record.

NZ702 172

Back down right of way

KB010 (NZ70248 17292, 47m): post mature Sycamore below path

Ramonia chrysophaea Ap R New to vice-county

Photo 2019-03-04-05



Photo 2019-03-04-05: Nab End Wood, Kilton Beck, top left, a post mature Sycamore with *Ramonia chrysophaea* NT (NS/IR/S41), new to Vice-county.

NZ702 174

Some more interesting Hazel looked at

NZ70275 17406

Species of Interest

Eopyrenula grandicula

Co Coll. Three septate conidia, 15 – 16 x 6µm. New to VC65. Herb. Sanderson 2578. New to north east England.

Thelotrema lepadinum

Co

Other Species

Arthonia didyma

Co

Opegrapha atra

Co

A1.3 White Cliff Wood

Low interest but lichen recorded in passing.

NZ7118

Porpidia tuberculosa

SSd

A2 Fountains Abbey 5/3/2019**A2.1 Weather**

Some light rain at first but then dry and trunks remained largely dry

A2.2 West of Studley Park

Deer park with groves of veteran Sweet Chestnut and Oak and scattered trees, also some Lime and Sycamore. Many trees with poor assemblages reflecting past acidification but some good Oak, Sweet Chestnut and Sycamore found.

SE2769**SE276 692**

FAB01 (SE27619 69237, 105m): Ancient Sweet Chestnut in park with exposed lignum and fallen limbs

Chaenothecopsis pusilla LCs Coll. Brown spores one septate, with pale septa. New to VC64.

Also

Amandinea punctata Cs
Buellia griseovirens LCs
Trapeliopsis flexuosa LCs

SE277 692

Amandinea punctata Ap
Caloplaca obscurella Ap
Opegrapha vulgata Ap
Xanthoria parietina Ap

SE277 691

FAB02 (SE27725 69176, 100m): post mature Lime on slope in park

Lecanora sublivescens Ti F On west side in streak.
New to VC64 and most northerly British record.

Also

Dendrographa decolorans Ti
Lecanora expallens Ti
Myriolecis dispersa Ti
Myriolecis hagenii Ti
Pertusaria coccodes Ti
Phaeophyscia orbicularis Ti
Physcia adscendens Ti
Rinodina oleae Ti
Xanthoria parietina Ti

Photos 2019-03-05-01, 2 & 7



Photos 2019-03-05-01, 2 & 7;: Studley Park, Fountains Abbey, FAB02, a veteran Lime tree with a population of *Lecanora sublivescens* NT (NS/IR/S41) (within magenta lines). This new to the vice-county and is the northern most known site in Britain.

FAB03 (SE27724 69161, 100m): broken ancient Lime on slope in park

Chaenotheca chlorella

LTi F Grey verrucose thallus with
Stichococcus algae; apothecia with yellow
pruina, mature spores brown & simple to 8 x
3µm. New to VC64 & N. England. Herb.
Sanderson 2579

Chaenothecopsis pusilla

LTi R Coll. Brown spores, one septate,
with pale septa. New to VC64. Herb. Sanderson
2580

Also

Lecanora expallens

LTi

Photo 2019-03-05-03



Photo 2019-03-05-03: Studley Park, Fountains Abbey, FAB03, a hollow veteran Lime tree with *Chaenotheca chlorella* NT (NS) and *Chaenothecopsis pusilla* Nb (NS) on lignum. Both species are new to the vice-county and the former new to northern England.

SE276 691

Amandinea punctata Q

SE276 690

Lecanora expallens Q

Pyrrhospora quernea Q

SE277 690**Species of Interest**

Chaenotheca trichialis Q SE2775 6908

SE278 690

Cladonia polydactyla var. *polydactyla* LQ

Lecanora expallens Cs

SE278 691

FAB04 (SE27800 69136, 85m): ancient Sweet Chestnut at base of slope, tag 0745

Chaenothecopsis nigra LCs O Herb. Sanderson 2581. One septate pale brown spores, with a dark septa. New to VC64

SE278 692

FA05 (SE27890 69208, 58m) Ancient Pedunculate Oak, rich pinhead assemblage on dry bark. Tag 0737

Chaenotheca stemonea Q R New to VC64

Also

Chaenotheca brachypoda Q O

Chaenotheca chrysocephala Q R

Chaenotheca hispidula Q O

Chaenotheca trichialis Q

Chrysothrix candelaris Q

Hypocenomyce scalaris Q

SE278 693**Species of Interest**

Chaenotheca trichialis Cs, Q SE2787 6932, SE2786 6937

Other Species

Cladonia digitata LCs

Cladonia polydactyla var. *polydactyla* LCs

Hypocenomyce scalaris LCs

Placynthiella icmalea LCs

SE278 694

Candelariella reflexa Q Tw

Candelariella vitellina f. *vitellina* Ti

Evernia prunastri Q Tw

Melanohalea elegantula Q Tw

Melanohalea laciniatula Q Tw

Parmelia saxatilis Q Tw

Parmelia sulcata Q Tw

Parmotrema perlatum Q Tw

Pertusaria flavida Ti SE2786 6943 Tag MD42, new to VC64

Physcia adscendens Q Tw

Physcia tenella Q Tw

Physconia perisidiosa Ti SE2786 6946 Tag 4234, new to VC64

Punctelia jeckeri Q Tw

Punctelia subrudecta s. str. Q Tw

Ramalina farinacea Q Tw

SE277 694

Opegrapha viridipruinosa Ti Coll., new to VC64

Phlyctis argena Ti

SE277 693

Bacidia rubella Ti SE2776 6938, first recent record

Cliostomum griffithii Ti

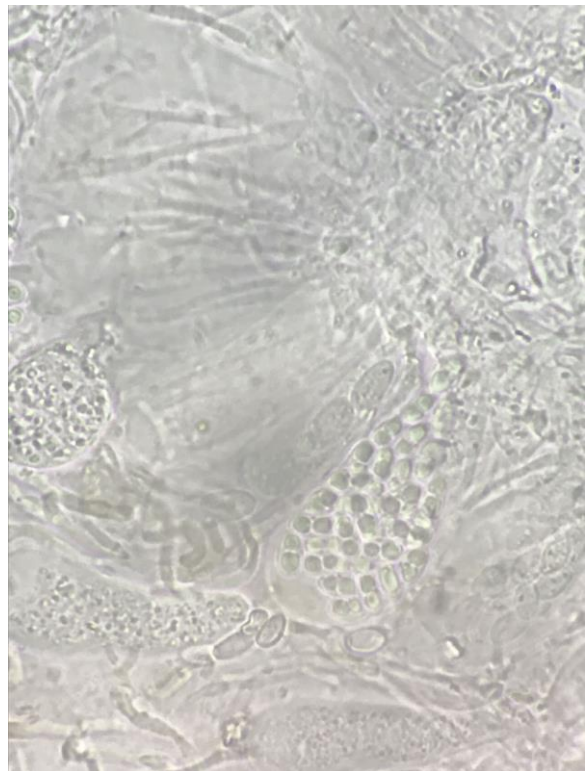
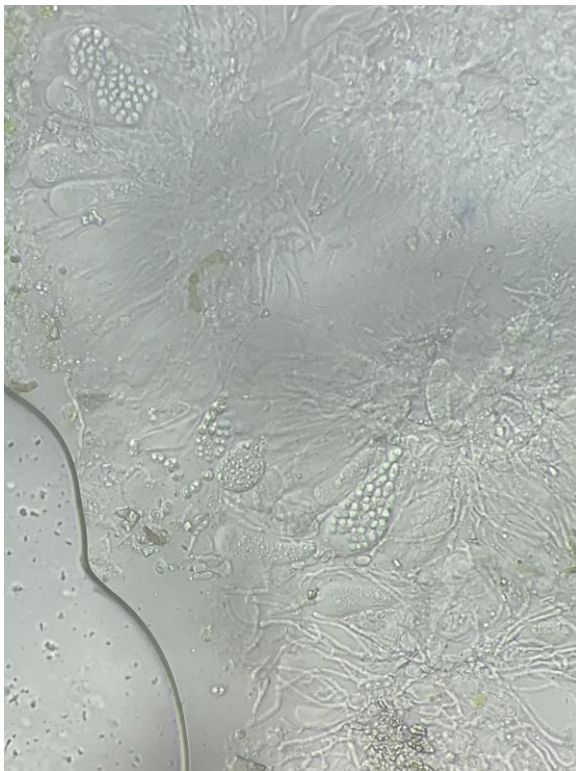
Pyrrhospora quernea Ti

A2.2 Fountains Abbey Gardens

This is the area where the *Chaenotheca gracilentia* was found somewhere near Robin Hood's Well at SE278683 on an Elm. This was not refound and most Wych Elm stools had been lost, although a few were re-growing. Some interesting old trees and good species for the region, but the area lacked the rare species found in Studley Park.

SE2768**SE274 683**

<i>Caloplaca flavocitrina</i>	Sm	
<i>Caloplaca ulcerosa</i>	Sm	
<i>Myriolecis sambuci</i>	Sm	Asci with about 32 spores, SE27458 68399. Herb. Sanderson 2582. New to VC64.
		Photos 2019-03-05-09 - 10
<i>Phaeophyscia orbicularis</i>	Sm	
<i>Physconia grisea</i>	Sm	
<i>Psoroglaena stigonemoides</i>	Sm	New to VC64.
<i>Rinodina oleae</i>	Sm	
<i>Xanthoria parietina</i>	Sm	



Photos 2019-03-05-01, 2 & 7: the gardens, Fountains Abbey, the asci of *Myriolecis sambuci* (*Lecanora sambuci*), distinguished by the high number of spore in the asci.

SE273 683

<i>Opegrapha ochrocheila</i>	Ti
------------------------------	----

SE274 681

<i>Chaenotheca ferruginea</i>	Q
<i>Lecanactis abietina</i>	Q

***Chaenotheca gracilentia* habitat:**

Wooded slope, rare regrowing Wych Elm stools, Larch plantation higher up slope but veteran Sycamore and some Pedunculate Oak lower down.

SE275 682**Species of Interest**

Chaenotheca trichialis Q SE2755 6822 Tag 1630
Porina byssophila Ug New to VC64.

Other Species

Aquacida viridifarinoso Ap New to VC64.
Opegrapha vermicellifera

SE276 682

SE2762 6826 post mature Sycamore

Species of Interest

Strigula taylorii Ap New to VC64.
Thelotrema lepadinum Ap

Other Species

Aquacida viridifarinoso Ap New to VC64.
Enterographa crassa Ap
Pertusaria hymenea Ap

Bacidina delicata Ap SE2766 6828

SE277 683**Species of Interest**

Porina byssophila Ap Coll. New to VC64.

Other Species

Anisomeridium polypori Ap

SE278 683

Sycamore by lake SE2784 6836

Species of Interest

Chaenotheca trichialis Ap
Strigula taylorii Ap New to VC64.

Other Species

Bacidia rubella Ap First recent record
Lecania cyrtellina Ap Coll. Spores 9 – 12 x 2.5 – 3µm simple, apothecia pale and sessile. Herb. Sanderson 2583
Pertusaria albescens var. *corallina* Ap

SE278 683**Species of Interest**

Chaenotheca trichialis Ap
Thelotrema lepadinum Ap
Strigula taylorii Ap New to VC64.

Other Species

Amandinea punctata Q
Aquacida viridifarinoso Ap

<i>Bacidia rubella</i>	Ap	
<i>Cliostomum griffithii</i>	Q	
<i>Lecania cyrtellina</i>	Ap	
<i>Opegrapha vulgata</i>	Ap	
<i>Pertusaria albescens</i> var. <i>corallina</i>	Ap	
SE278 683		
<i>Aquacida viridifarinoso</i>	Ug	New to VC64.
<i>Opegrapha vermicellifera</i>	Ug	
SE2868		
SE280 684		
<i>Arthonia radiata</i>	Ap	
<i>Arthonia vinosa</i>	Ap	SE2802 6842
<i>Melanelixia glabratula</i>	Ap	
SE281 684		
Species of Interest		
<i>Thelotrema lepadinum</i>	Ti	
Other Species		
<i>Aquacida viridifarinoso</i>	Ap, Ti	
<i>Enterographa crassa</i>	Ap, Ti	
SE282 684		
Species of Interest		
<i>Thelotrema lepadinum</i>	Fx	
Other Species		
<i>Enterographa crassa</i>	Fx	
To the east, the Beech – Yew Woods seem dull		
SE282 685		
<i>Arthonia radiata</i>	Sx	
SE280 689		
<i>Lecania cyrtellina</i>	Ap	
SE2869		
SE280 690		
<i>Calicium viride</i>	Ap	

A2.4 South East of Studley Park

Further searching thought the Deer Park to the south and east. Again most trees acidified and poor but some important trees were found including Sweet Chestnuts and an ancient Maple.

SE2769

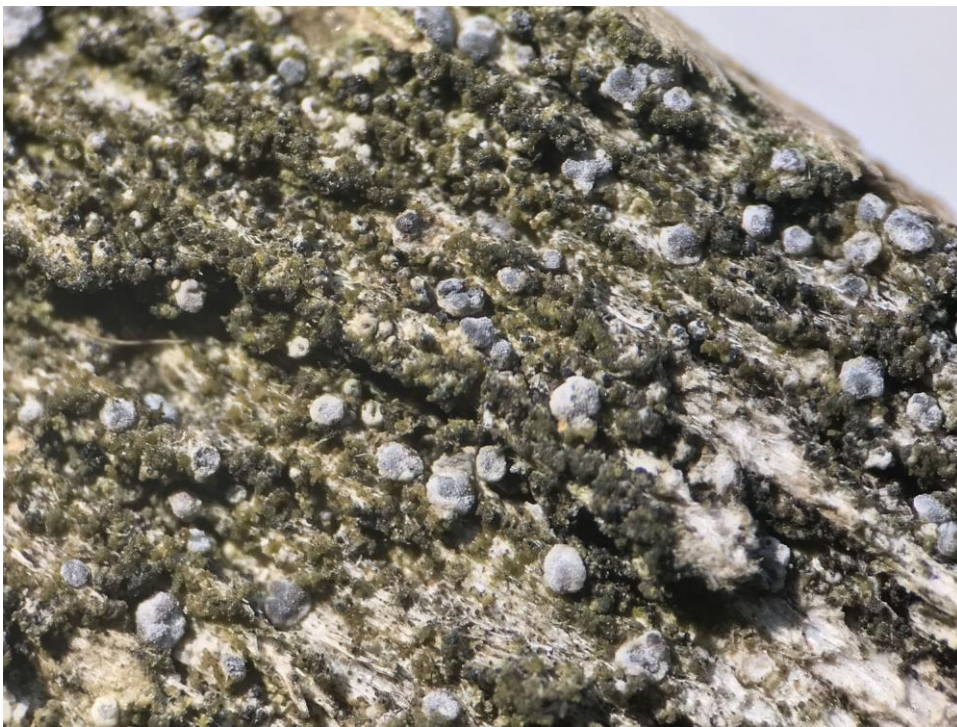
SE279 693

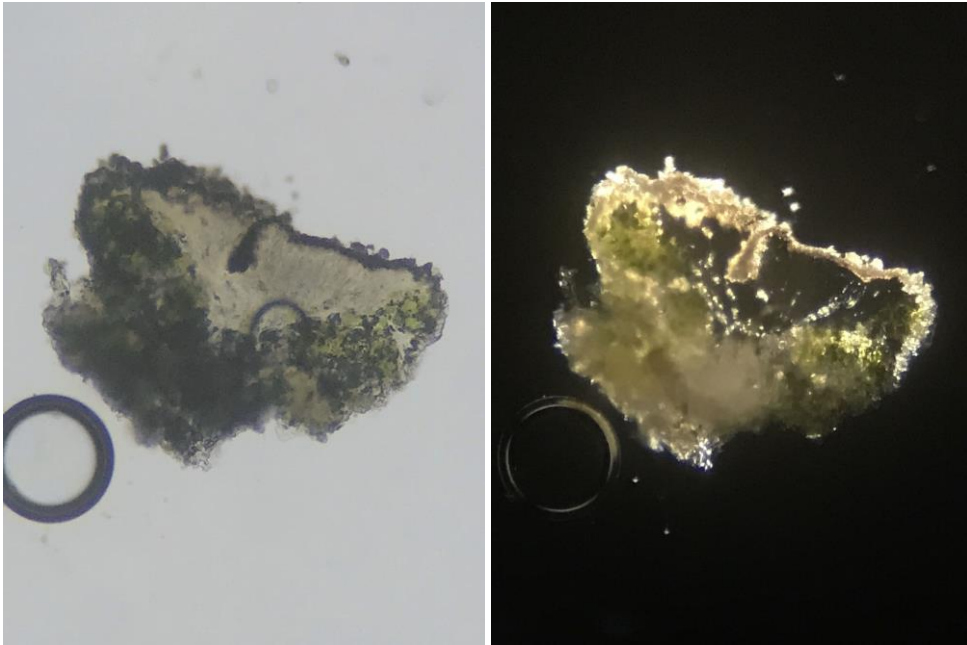
SE2794 6934 fallen Sweet Chestnut
Lecanora sarcopidoides

LCs Dark brown disks which are strongly pruinose; crystals in epithecium and margin fine, yellow in polarised light, soluble in K; paraphyses branched with swollen cap to 2.5 – 3µm with, with dark pigment; asci 25 – 28 x 10µm; spores simple 7 – 10 x 3µm; mesopycnidia frequent about 160µm across, conidia simple, 2 x 1µm. Herb. Sanderson 2607. New to northern England, second modern English record. **Photos** 2019-03-05-11 – 14.

Strangospora moriformis

LCs Apothecia blackish; epithecium pale blue-grey.





Photos 2019-03-05-11 – 13: Studley Park, Fountains Abbey, *Lecanora sarcopidoides*, a rarely recorded species in the *Lecanora saligna* group, found lignum on a fallen Chestnut tree. Lower left apothecia cross-section in water in normal light and in water and polarised light.

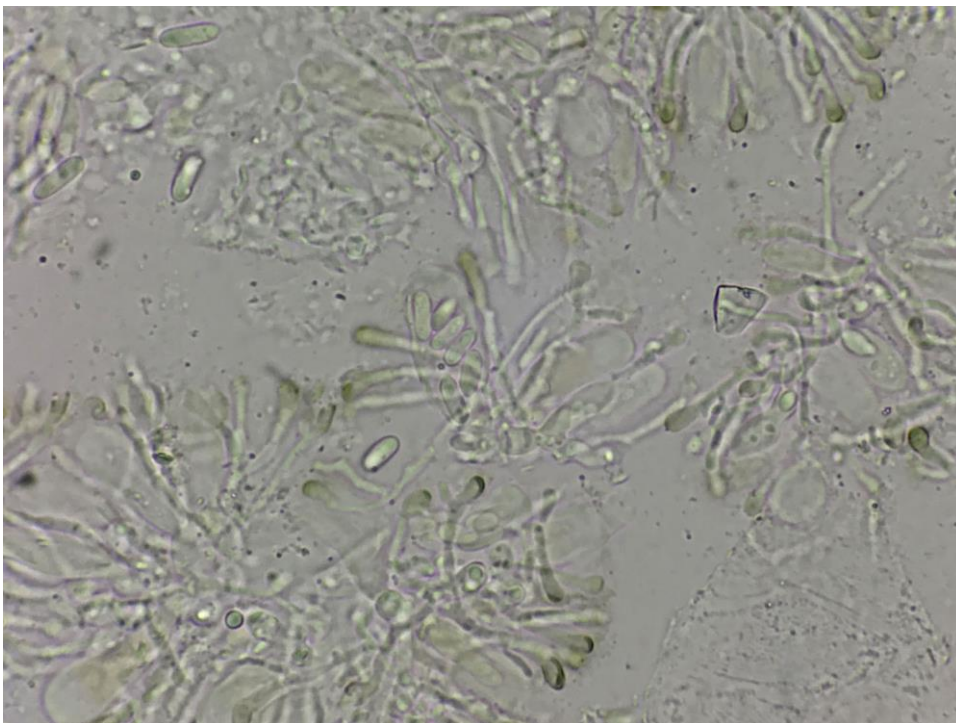


Photo 2019-03-05-14: Studley Park, Fountains Abbey, *Lecanora sarcopidoides*, a rarely recorded species in the *Lecanora saligna* group, found lignum on a fallen Chestnut tree. Apothecia squash with paraphyses, asci and spores.

Physconia perisidiosa
Xanthoria parietina

Q Tw New to VC64.
Q Tw

SE2869

SE280 693

Chaenotheca trichialis Q

SE282 692

Diploicia canescens Ap

SE283 693

FA06 (SE28313 69376, 65m): ancient Sweet Chestnut by river (GPS reading out more like SE28306935)

Chaenotheca stemonea Cs F New to VC64

Also

Chaenotheca trichialis Cs

Photo 2019-03-05-4 Left & 8





Photos 2019-03-05-04 - 8: Studley Park, Fountains Abbey, FA06, the Sweet Chestnut to the left has *Chaenotheca stemonea* Nb (NS). The lower picture shows *Chaenotheca stemonea* in a crevice in the Sweet Chestnut bark.

FA07 (SE28392 69210, 65m): ancient Sweet Chestnut in ravine bottom

Chaenothecopsis nigra LCs O Coll. One septate pale brown spores, with a dark septa. Herb. Sanderson 2584. New to VC64

FA08 (SE28554 69060, 60m): ancient Sweet Chestnut in ravine bottom

Chaenothecopsis nigra LCs One septate spores, which are darker brown than usual, with a dark septa. Herb. Sanderson 2585. New to VC64

Also

Chaenotheca trichialis LCs

Opegrapha viridipruinosa Cs

SE285 691

Agonimia tristicula Q

Cladonia pyxidata Q

To east of deer park

SE284 695

SE2842 6952 old Maple

Bacidia rubella Ac First recent record

SE2849 6954 ancient Pedunculate Oak

Chaenotheca trichialis Q

SE284 696

Physconia grisea

Ap

FA09 (SE28418 69627, 58m): ancient hollow Maple

Bacidia incompta

LAc

O

Single disk and some pycnidia

Photo 2019-03-05-5



Photo 2019-03-05-05: Studley Park, Fountains Abbey, FA09, an ancient hollow Maple with a streak of *Bacidia incompta* VU (NS/S41).

SE2769

SE279 694

Chaenotheca trichialis

Q

SE2794 6944

A2.5 Fountains Abbey Gardens

Back in garden

SE2768

SE278 688

Chaenotheca ferruginea

Q

Thelotrema lepadinum

Q

SE278 687

Arthonia spadicea

Q

Chaenotheca trichialis

Q

SE2785 6871

SE279 685

SE2798 6855 old Sycamore

Calicium viride

Ap

Chaenotheca trichialis Ap
Thelotrema lepadinum Ap

SE272 683
Candelaria concolor Ap

ANNEX 2 Species Lists

General Key

Species

s. str. = In the strict sense, a recently split up species, recorded in the new tighter definition

s. lat. = In the loose sense, a species previously recorded on a wider definition than now and subsequently split up

SWI

1 = Species used to calculate the Suboceanic Woodland Index (based on the former SIEC with significant modifications)

SOWI

1 = Species used to calculate the Southern Oceanic Woodland Index (based on the former NIEC with minor modifications)

PHI

1 = Species used to calculate the Pinhead Index

Conservation Status

VU = Vulnerable Red Data Book species

NT = Near Threatened Red Data Book species

Nb = Notable species (NR, NS, or IR species of conservation significance not RDB NT or higher)

NR = Nationally Rare

NS = Nationally Scarce

IR = International Responsibility species

S41 = Section 41 species

(NS) = Nationally Scarce species not regarded as a Notable species; an under recorded or ruderal species of limited conservation significance

New = New to the vice-county

SPECIES LIST 1
Loftus, Kilton Beck 2019 Survey

Species	Substrate	SWI	SOWI	PHI	Conservation Status
<i>Agonimia allobata</i>	Ug		1		Nb (NS)
<i>Agonimia flabelliformis</i>	Q		1		Nb (NR) New
<i>Anisomeridium polypori</i>	Ap, Ug, Q				
<i>Aquacida viridifarinsa</i>	Ti, LTi, Ug, Al, Ap, Q				
<i>Arthonia didyma</i>	Ap, Co				
<i>Arthonia radiata</i>	Fx Tw				
<i>Arthonia spadicea</i>	Ug, Ti, Al, Q				
<i>Chaenotheca furfuracea</i>	Terr			1	
<i>Chaenotheca</i> sp	Ug				
<i>Chaenotheca trichialis</i>	LQ, Q	1	1	1	
<i>Cladonia coniocraea</i>	Fx, Al				
<i>Cladonia humilis</i>	Pp				
<i>Cliostomum griffithii</i>	Ap, Fx				
<i>Dendrothele acerina</i>	Ac				
<i>Enterographa crassa</i>	Q				
<i>Enterographa hutchinsiae</i>	Ug				
<i>Eopyrenula grandicula</i>	Co				Nb (NS/IR)
<i>Graphis scripta</i>	Co				
<i>Inoderma subabietinum</i>	Q, LHe		1		Nb (IR) New
<i>Lecanactis abietina</i>	Q, Fx, Ti				
<i>Lecania cyrtellina</i>	Fx, Ug				
<i>Lecania naegelii</i>	Fx Tw				
<i>Lecanora expallens</i>	Ap				
<i>Lecidella elaeochroma</i> f. <i>elaeochroma</i>	Fx Tw				
<i>Melanelixia glabrata</i>	Ap				
<i>Melanelixia subaurifera</i>	Fx Tw				
<i>Micarea prasina</i> s. str.	LQ				
<i>Micarea viridileprosa</i>	Q, LQ				(NS) New
<i>Opegrapha atra</i>	Co				
<i>Opegrapha calcarea</i>	SSd				
<i>Opegrapha ochrocheila</i>	LTi, Ug, LFx, Ap				
<i>Opegrapha vermicellifera</i>	Ug				
<i>Parmelia sulcata</i>	Fx Tw				
<i>Phlyctis argena</i>	Ap, Ug				
<i>Physcia adscendens</i>	Fx Tw				
<i>Physcia tenella</i>	Fx Tw				
<i>Porina aenea</i>	Q				
<i>Porina byssophila</i>	Ac, Ap				Nb (NS)
<i>Porpidia tuberculosa</i>	SSd				
<i>Psilolechia lucida</i>	Terr				
<i>Pyrrhospora quernea</i>	Q				
<i>Ramonia chrysophaea</i>	Ug, Ap				NT (NS/IR/S41) New
<i>Thelotrema lepadinum</i>	Fx, Q, Ti, Co	1	1		
<i>Trapeliopsis pseudogranulosa</i>	Al				
<i>Xanthoria parietina</i>	Fx Tw				

August 2019

*A Search for Chaenotheca gracilentia, Yorkshire
Botanical Survey & Assessment*

Species Total: 45

Sub-oceanic Woodland Index (SWI) score: 2

Southern Oceanic Woodland Index (SOWI) score: 5

Pinhead Index (PHI) score: 2

SPECIES LIST 2
Fountains Abbey, 2019 Survey

Species	Studley Park	Landscape Garden	SWI	SOWI	PHI	Conservation Status
<i>Agonimia tristicula</i>	Q					
<i>Amandinea punctata</i>	Cs, Ap, Q	Q				
<i>Anisomeridium polypori</i>		Ap				
<i>Aquacida viridifarinoso</i>		Ap, Ti, Ug				New
<i>Arthonia radiata</i>		Ap, Sx				
<i>Arthonia spadicea</i>		Q				
<i>Arthonia vinosa</i>		Ap	1	1		
<i>Bacidia incompta</i>	LAc					VU (NS/S41)
<i>Bacidia rubella</i>	Ti, Ac	Ap				
<i>Bacidina delicata</i>		Ap				
<i>Buellia griseovirens</i>	LCs					
<i>Calicium viride</i>		Ap			1	
<i>Caloplaca flavocitrina</i>		Sm				
<i>Caloplaca obscurella</i>	Ap					
<i>Caloplaca ulcerosa</i>		Sm				
<i>Candelaria concolor</i>		Ap				
<i>Candelariella reflexa</i>	Q Tw					
<i>Candelariella vitellina</i> f. <i>vitellina</i>	Ti					
<i>Chaenotheca brachypoda</i>	Q		1	1	1	
<i>Chaenotheca chlorella</i>	LTi		1		1	NT (NS) New
<i>Chaenotheca chrysocephala</i>	Q		1	1	1	New
<i>Chaenotheca ferruginea</i>		Q			1	
<i>Chaenotheca hispidula</i>	Q		1	1	1	Nb (NS)
<i>Chaenotheca stemonea</i>	Q, Cs		1	1	1	Nb (NS)
<i>Chaenotheca trichialis</i>	Cs, Q, LCs	Q, Ap	1	1	1	
<i>Chaenothecopsis nigra</i>	LCs		1		1	Nb (NS) New
<i>Chaenothecopsis pusilla</i>	LCs, LTi				1	Nb (NS) New
<i>Chrysothrix candelaris</i>	Q					
<i>Cladonia digitata</i>	LCs					
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>	LQ, LCs					
<i>Cladonia pyxidata</i>	Q					
<i>Cliostomum griffithii</i>	Ti	Q				
<i>Dendrographa decolorans</i>	Ti					
<i>Diploicia canescens</i>	Ap					
<i>Enterographa crassa</i>		Ap, Ti, Fx				
<i>Evernia prunastri</i>	Q Tw					
<i>Hypocenomyce scalaris</i>	Q, LCs					
<i>Lecanactis abietina</i>		Q				
<i>Lecania cyrtellina</i>		Ap				
<i>Lecanora expallens</i>	Ti, LTi, Q, Cs					
<i>Lecanora sarcopidoides</i>	LCs					Nb (NR) New
<i>Lecanora sublivescens</i>	Ti					NT (NS/IR/S41) New
<i>Melanelixia glabratula</i>		Ap				

Species	Studley Park	Landscape Garden	SWI	SOWI	PHI	Conservation Status
<i>Melanohalea elegantula</i>	Q Tw					
<i>Melanohalea laciniatula</i>	Q Tw					
<i>Myriolecis dispersa</i>	Ti					
<i>Myriolecis hagenii</i>	Ti					
<i>Myriolecis sambuci</i>		Sm				New
<i>Opegrapha ochrocheila</i>		Ti				
<i>Opegrapha vermicellifera</i>		Ap, Ug				
<i>Opegrapha viridipruinosa</i>	Ti, Cs					(NS) New
<i>Opegrapha vulgata</i>	Ap	Ap				
<i>Parmelia saxatilis</i>	Q Tw					
<i>Parmelia sulcata</i>	Q Tw					
<i>Parmotrema perlatum</i>	Q Tw					
<i>Pertusaria albescens</i> var. <i>corallina</i>		Ap				
<i>Pertusaria coccodes</i>	Ti					
<i>Pertusaria flavida</i>	Ti					New
<i>Pertusaria hymenea</i>		Ap				
<i>Phaeophyscia orbicularis</i>	Ti	Sm				
<i>Phlyctis argena</i>	Ti					
<i>Physcia adscendens</i>	Ti, Q Tw					
<i>Physcia tenella</i>	Q Tw					
<i>Physconia grisea</i>	Ap	Sm				
<i>Physconia perisidiosa</i>	Ti, Q Tw					New
<i>Placynthiella icmalea</i>	LCs					
<i>Porina byssophila</i>		Ug, Ap				Nb (NS) New
<i>Psoroglaena stigonemoides</i>		Sm				New
<i>Punctelia jeckeri</i>	Q Tw					
<i>Punctelia subrudecta</i> s. str.	Q Tw					
<i>Pyrrhospora quernea</i>	Q, Ti					
<i>Ramalina farinacea</i>	LQ Tw					
<i>Rinodina oleae</i>	Ti	Sm				
<i>Strangospora moriformis</i>	LCs					(NS)
<i>Strigula taylorii</i>		Ap				Nb (NS/IR) New
<i>Thelotrema lepadinum</i>		Ap, Ti, Fx, Q	1	1		
<i>Trapeliopsis flexuosa</i>	LCs					
<i>Xanthoria parietina</i>	Ap, Ti, Q Tw	Sm				

Species Total: 78

Sub-oceanic Woodland Index (SWI) score: 9

Southern Oceanic Woodland Index (SOWI) score: 7

Pinhead Index (PHI) score: 10

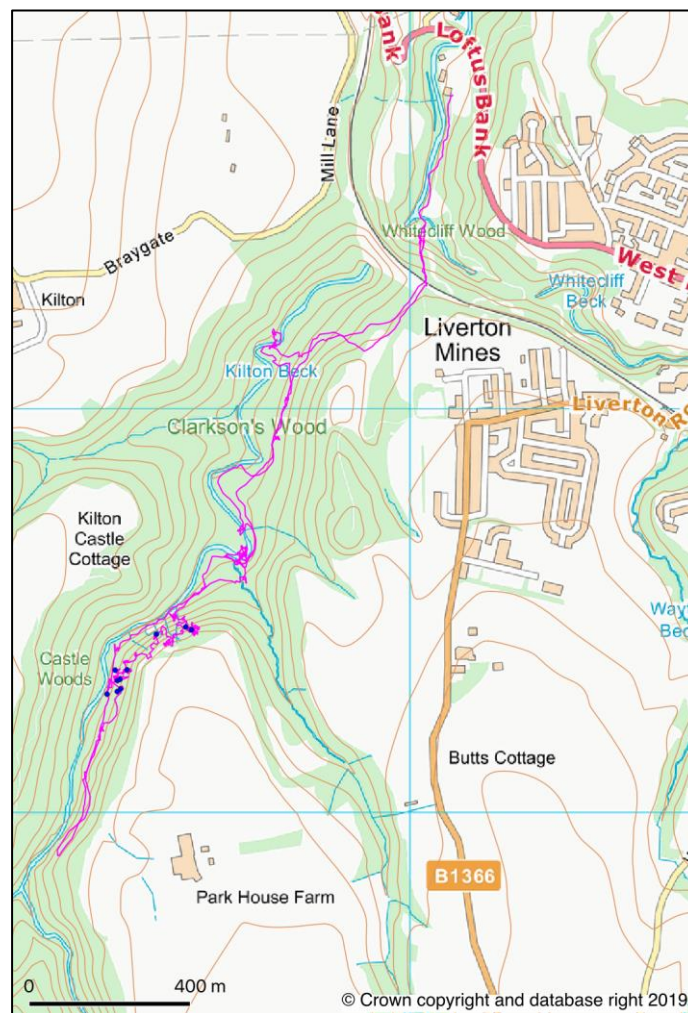
ANNEX 3 Maps

B1 General Maps, Loftus, Kilton Beck

Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
023 8029 3671

Chaenotheca gracilentia Survey

Loftus, Kilton Beck 2019 Survey Map 1

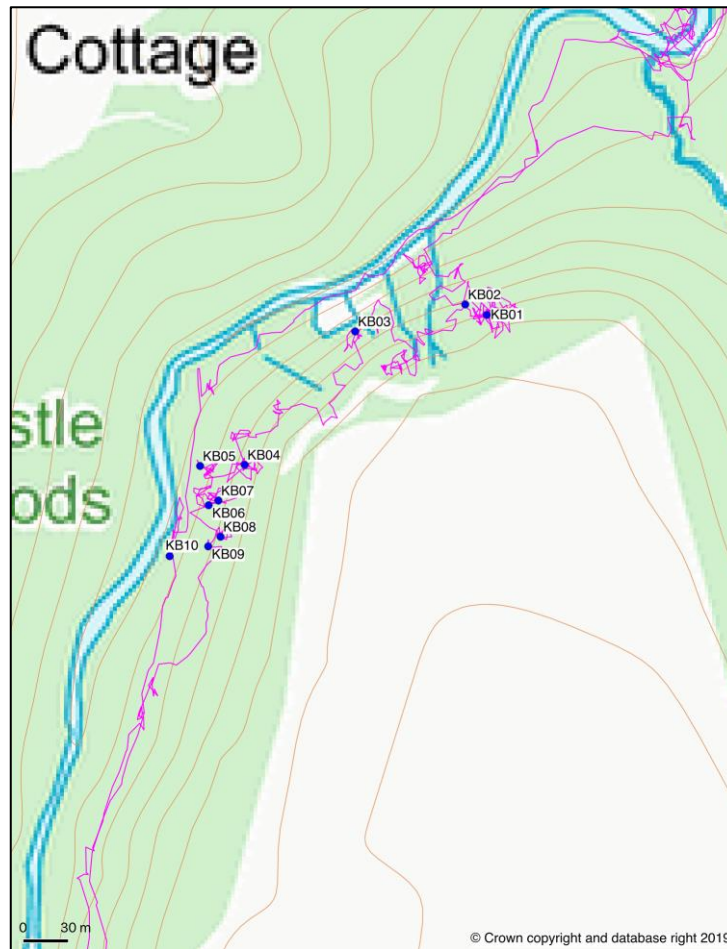


Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
023 8029 3671

Chaenotheca gracilentia Survey

Loftus, Kilton Beck Waypoints

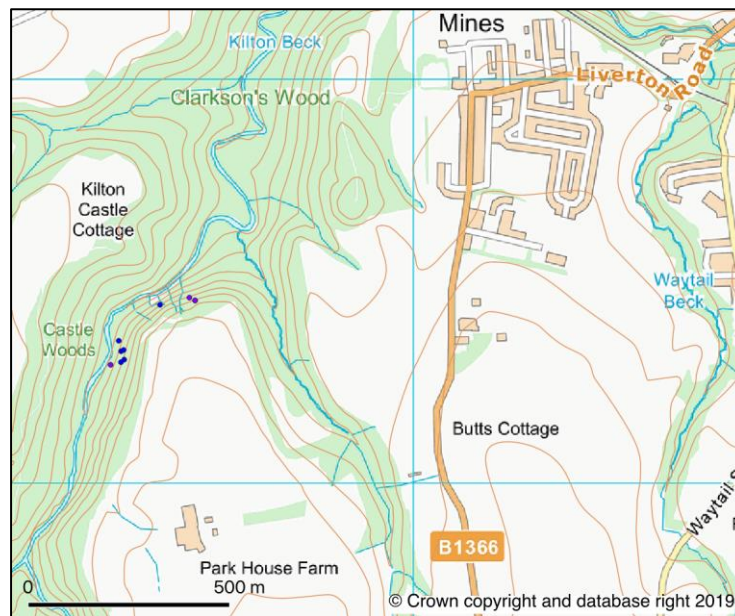
Map 2



Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
023 8029 3671

Chaenotheca gracilentia Survey

Loftus, Kilton Beck Conservation Map 3



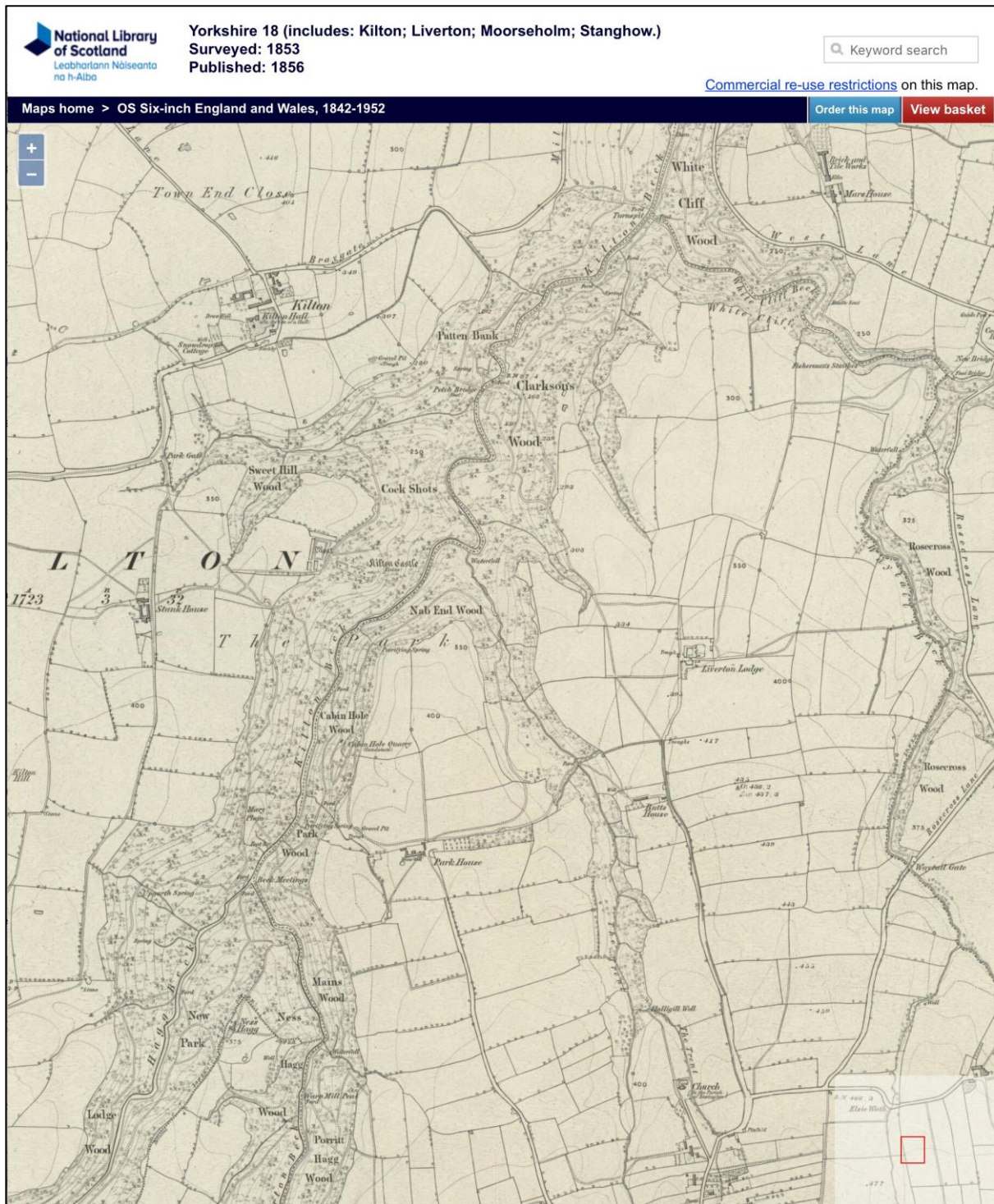
Key
Blue dot = Notable species
Magenta dot = Section 41 species

Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
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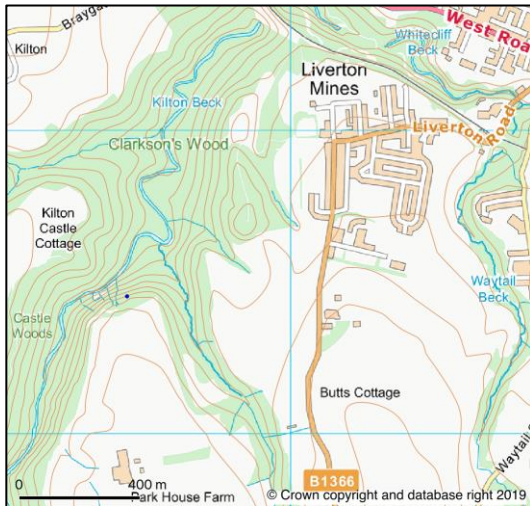
Chaenotheca gracilentia Survey

OS Map Surveyed 1853

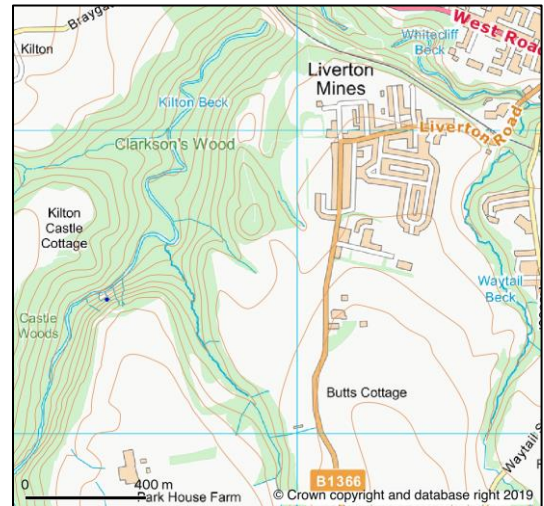
Map 4



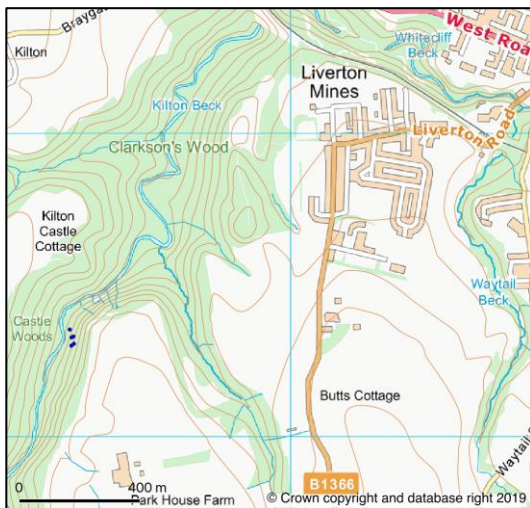
B2 Species Maps, Loftus, Kilton Beck



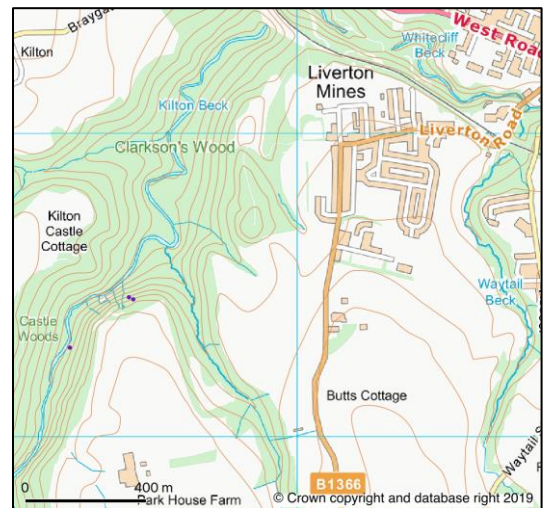
Map 5 *Agonimia allobata*



Map 6 *Agonimia flabelliformis*



Map 7 *Inoderma subabietinum*



Map 8 *Ramonia chrysophaea*

B3 General Maps, Fountains Abbey

Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
023 8029 3671

Chaenotheca gracilenta Survey

Fountains Abbey, 2019 Survey

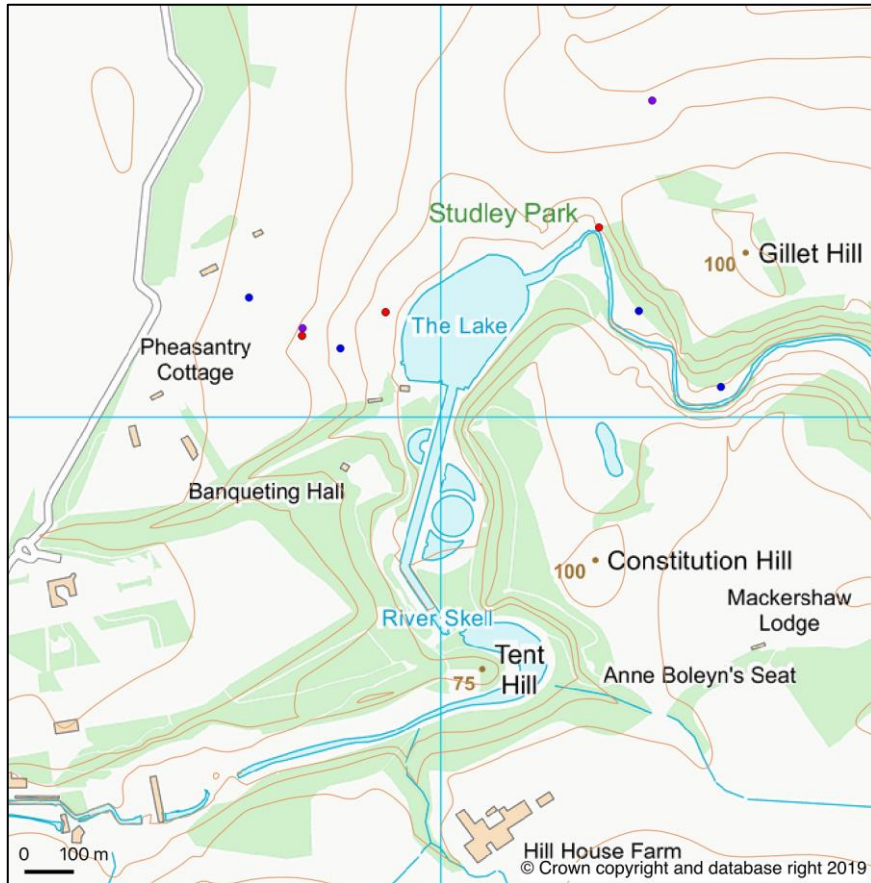
Map 9



Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
023 8029 3671

Chaenotheca gracilentia Survey

Fountains Abbey, Conservation Map 10



Key

Blue dot = Notable species

Red dot = Near Threatened species in national or English RDB, not included in Section 41

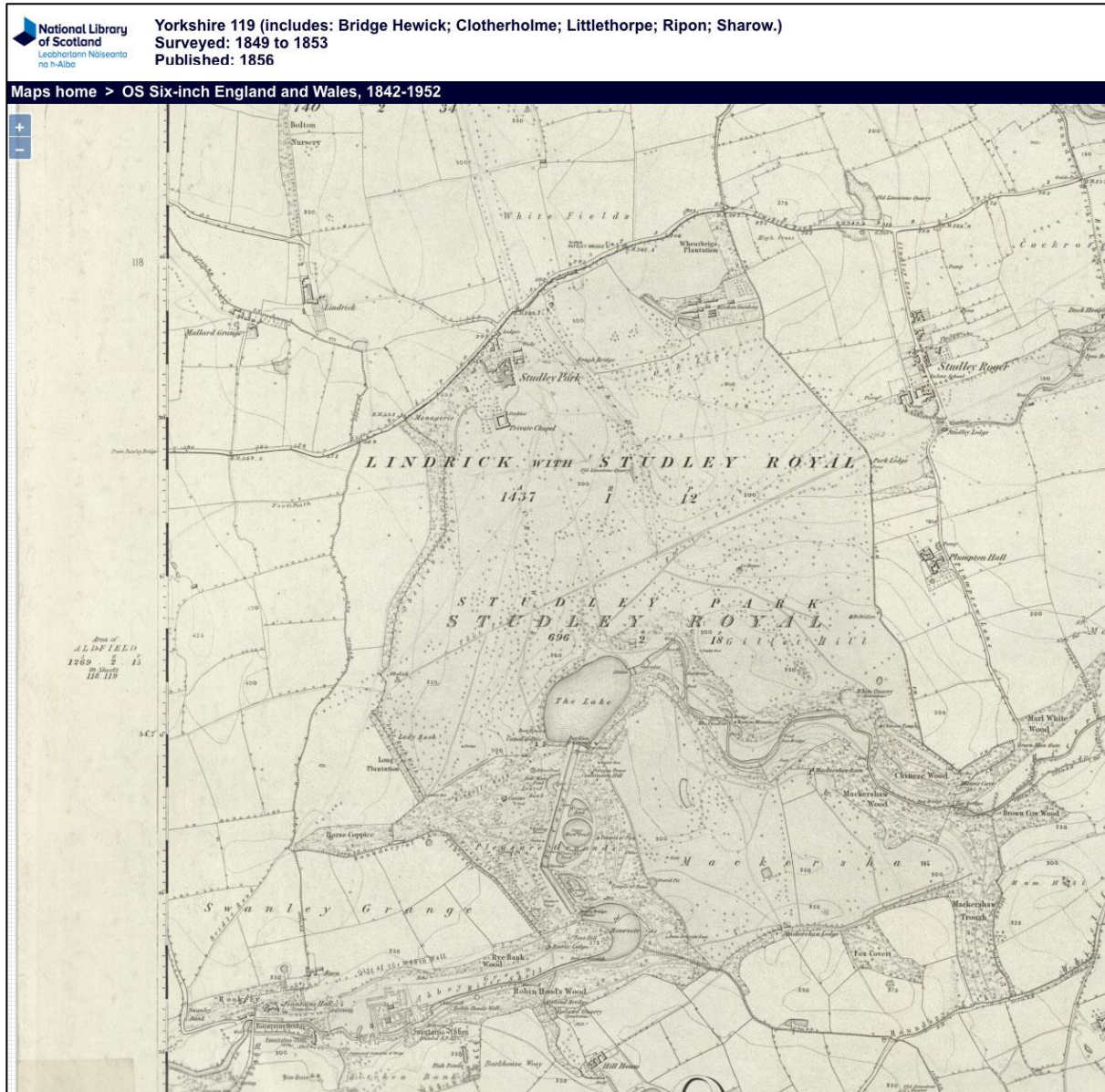
Magenta dot = Section 41 species

Botanical Survey and Assessment
3 Green Close, Woodlands, SO40 7HU
023 8029 3671

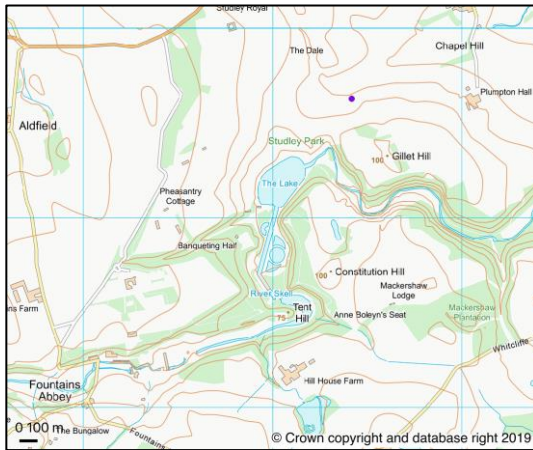
Chaenotheca gracilentia Survey

OS Map Surveyed 1849 - 53

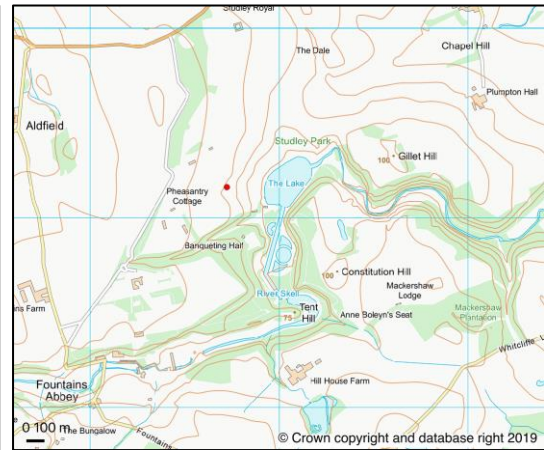
Map 11



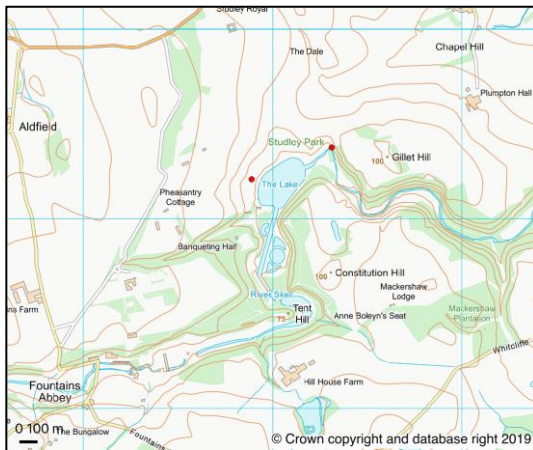
B4 Species Maps, Fountains Abbey



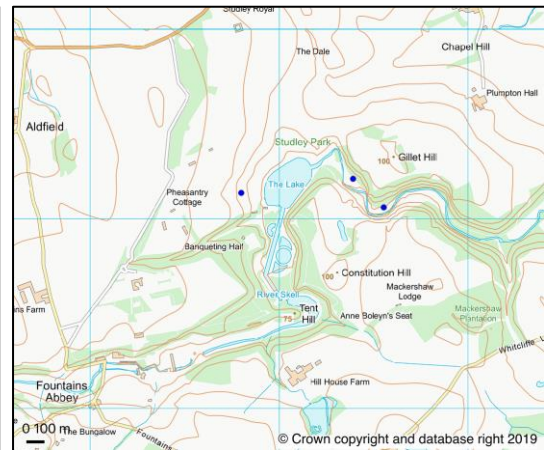
Map 12 *Bacidia incompta*



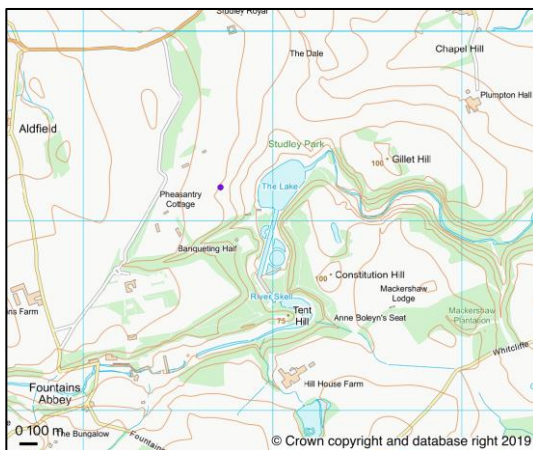
Map 13 *Chaenotheca chlorella*



Map 14 *Chaenotheca stemonea*



Map 15 *Chaenothecopsis nigra*



Map 16 *Lecanora sublivescens*