

LICHEN SURVEY OF BURNHAM BEECHES NNR
BUCKINGHAMSHIRE
2020



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EPIPHYTIC LICHEN SURVEY OF BURNHAM BEECHES BUCKINGHAMSHIRE, 2020

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Cover Photograph: Burnham Beeches, Crabtree Heath, tree BUB053 (Tag 01086), a lapsed Beech pollard with the rare lichens *Pyrenula nitidella* Ex (NR) and *Bellicidia incompta* (*Bacidia incompta*) VU (NS/S41). Both were recently discovered at Burnham Beeches but were shown by this survey to have nationally important populations here. The former was until recently thought to be extinct in Britain and grows in intermittently flushed bark, while the latter grows in wound tracks, here inside the hollow trees.

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EPIPHYTIC LICHEN SURVEY OF BURNHAM BEECHES NNR BUCKINGHAMSHIRE, 2020 2018

SUMMARY

Survey

A reconnaissance survey was carried out in 2018 during an examination of the last known *Pyrenula nitida* VU (NR/S41) tree, which had died. This revealed a far richer lichen assemblage on old Beeches than was implied by existing data, including more trees with *Pyrenula nitida* and *Scutula circumspecta* (*Bacidia circumspecta*) VU (NS/S41), new to the region. This was confirmed by a short visit during further translocation work, when *Pyrenula nitidella* Ex (NR), which was until recently thought extinct in Britain, was found. In 2020, a full scale survey was carried out over four days in early summer. The survey was carried out in good conditions and systematically recorded the important trees in ancient pasture woodland areas, while transects were made across the former coppices of New Coppice and Fleet Wood.

Results

Species Totals: since the 1920s a total of 174 taxa of epiphytic lichens and associated fungal taxa have been recorded from the NNR, of which 121 were seen in 2018 – 20. Large numbers of the latter were new to the sites, with 26 new vice-county records made. The Pinhead Index score is 13 for all data, with 11 recorded since 2010 and 10 for the 2018 – 20 survey, with the threshold for SSSI quality 10. The Southern Oceanic Woodland Index (SOWI) scores 21 for all data, with 20 recorded since 2000 and 19 for the 2018 – 20 survey, with the threshold for SSSI quality 20, but this total is also by some way the highest score in the SSSI Area of Search (Thames Valley Natural Character Area 115).

As well as these features, there are three species that qualify for SSSI site selection in their own right as Threatened lichens in Britain (Vulnerable or higher threatened species, or Near Threatened species that are International Responsibility species with viable populations): *Bellicidia incompta* (*Bacidia incompta*), *Pyrenula nitida* and *Scutula circumspecta* (*Bacidia circumspecta*). In addition, *Pertusaria pustulata* and *Porina hibernica* were only found on single trees each, so the presence of viable populations here is not yet proven. Also *Pyrenula nitidella* was assessed as Extinct by Wood & Coppins (2012), but has since been refound and is probably likely to be assessed as at least Endangered in the next Red List so the population here will also be a feature of national significance.

The survey confirmed that the lichen interest of Burnham Beeches was greatly underrated in the old data, with the 2018 – 20 survey adding numerous species of interest. The site supports the richest southern oceanic old growth woodland lichen assemblage in the Thames Basin and a nationally significant pinhead assemblage of specialist lichens on lignum and dry bark on old and standing Oak dead trees. The lichen assemblage at Burnham Beeches has been badly damaged by past acidifying

pollution. What survives, however, represents the richest surviving example of a southern oceanic Beech wood lichen assemblage known outside of the New Forest in Britain. Important habitats are flushed less acid bark, mainly on Beech, but also on Oak, associated wound track habitats, where the very rare moss *Zygodon forsteri* EN (NR/S41) is also found in association with rare lichens. Veteran Oaks, both alive and dead, also support significant assemblages in lignum and dry bark habitats.

The lichen interest is strongly associated with well-lit but sheltered veteran trees in the pasture woodlands. Some, but limited, colonisation by species of interest has occurred within the old growth stands on to younger trees, but almost nothing into adjacent maturing former enclosed woodlands as yet. This is a much more limited degree of colonisation than would be expected in clean air woodlands. Under current conditions on the common, much of the lichen interest is highly dependent on the regular halo thinning around the veteran trees to prevent deep shade developing and destroying the lichen interest.

Assemblages: the main individual habitats and assemblages contributing strongly to this national significance are:

Flushed Base Rich Bark on Veteran Trees (*Agonimion octosporae*, *Pyrenuletum nitidae* & *Pertusarietum amarae*): found on less acid flushed bark veteran trees, mainly Beech here but rarely on Oak in sheltered parts of the site. These communities are largely direct survivors from pre-pollution communities, which were protected by higher pH stem flows from the impact of acidifying pollution. There has been a clear recovery on some trees with rare species, including *Pyrenula nitida*, colonising on to bark than had been acidified in the 20th century. Colonisation on to new trees is much rarer and mainly seen in the middle section of the central valley by Burnham Walk, and mostly by the most nationally widespread species. Exceptions to this were two instances of probably *Pyrenula nitida* colonising on to suppressed slow growing young Beeches. In 2020, four Beeches out of 29 supporting interesting examples of this assemblage were dead, two having died since 2018.

A total of 25 species of conservation interest were recorded from this habitat, all of which were found in 2018. These include one species recently thought Extinct (*Pyrenula nitidella*), three Vulnerable (*Pertusaria pustulata*, *Pyrenula nitida* & *Scutula circumspecta* (*Bacidia circumspecta*)), one Near Threatened species (*Porina hibernica*) and eight Notable species (*Agonimia flabelliformis*, *Coenogonium tavaresianum*, *Opegrapha corticola*, *Porina borreri*, *Porina byssophila*, *Rinodina roboris*, *Sporodophoron cretaceum* & *Strigula taylorii*), along with 12 regionally rare or uncommon species, including *Porina multipuncta* and *Thelopsis rubella*.

This is an impressive assemblage for a site that was thought to have little lichen interest surviving, but compared to the New Forest assemblage, they are many species missing here that may have been lost from the site due to the last century or so of acidifying pollution.

Wound Tack Assemblages (*Gyalectinetum carneoluteae*): well developed wound tracks are an important habitat strongly associated with the flushed bark habitat. These develop in rain tracks impacted by exudates from wounds, which produces an extreme habitat colonised by a few specialist species, some very rare, including here, one Vulnerable lichen and one Endangered moss, along with four Notable lichens and one regionally rare species. The rare species are confined to wounds on veteran trees and the habitat was best developed on veteran Elms and has obviously declined in recent years, with the loss of old Elms. Beech, however, supports a good range of these species and Burnham Beeches is an important site for this assemblage. A total of 19 Beeches supported threatened species, with one unusual occurrence on an Oak. These were the vulnerable lichen *Bellicidia incompta* (*Bacidia incompta*) and the Endangered moss *Zygodon forsteri*. Both have their largest populations in Britain outside of the New Forest here. Notable species found in the wound track were (*Porina borrieri*, *Porina byssophila*, *Scytinium subtile* (*Leptogium subtile*) and *Strigula taylorii*).

This is a reasonably complete assemblage for would tracks on veteran Beech but one missing species is *Scytinium fragrans* (*Collema fragrans*) EN (NR/IR/S41), which is strongly associated with the moss *Zygodon forsteri* in the New Forest.

Dry Lignum (*Calicietum abietinae*) & Damp Lignum (*Cladonietum coniocraeae*) Communities: a variety of species poor communities develop on bare wood (lignum), both on live trees and dead trees. Where large pieces of dead wood or very dry bark on old trees occur, as is typical in old growth stands, uncommon specialist species can occur. The most widespread community (Damp Lignum Community) is found on damper dead wood and stumps with the lichens *Cladonia* species dominant. This habitat is found beyond old growth stands, however, it can support species of interest. A more specialist habitat occurs on acid dry wood on vertical surfaces of either standing dead wood or the sides and undersides of very large fallen logs (Dry Lignum Community). In Burnham Beeches some interest was recorded on standing dead Beech and fallen Oak, but the most interesting communities were found on standing Oak dead wood. Most systematically recorded species of interest were on standing dead Oaks (27 trees) or on lignum exposed on veteran Oaks (four trees), with one standing dead Scots Pine and one live Beech also recorded. The best trees are in more exposed areas of the common and are absent from the richest area for Beech in the central valley. Shading is an issue for lichen interest on a significant number of standing dead trees (nine) as these have not been systematically halo-thinned.

At Burnham Beeches a total of ten species of high interest have been recorded from this habitat, including seven notable species (*Chaenotheca hispidula*, *Chaenothecopsis nigra*, *Chaenothecopsis pusilla*, *Cladonia incrassata*, *Lecidea nylanderii* & *Microcalicium ahlneri*) and three regionally uncommon species including *Chaenotheca brunneola*.

Compared to the other habitats this is a much more compete assemblage and the damage from past acidification has been more limited.

Dry Bark Assemblages on Veteran Trees (*Lecanactidetum premneae* & *Calicietum hyperelli*): this habitat occupies the dry sides of ancient Oaks and rarely other tree species. The most distinctive community, Ancient Dry Bark Community (*Lecanactidetum premneae*), is strongly associated with veteran Oaks and old growth woodland. It is internationally very rare, and otherwise known only from a few sites in France, but is widespread in southern Britain. On very dry bark this community grades into more general dry bark communities, including the Dry Bark Community (*Calicietum hyperelli*). This is more typical of drier, less oceanic climates but can also support some specialist species, especially pinhead lichens.

At Burnham Beeches this habitat was found in the similar areas as the lignum habitats, sometimes on the same trees. Seventeen systematically recorded Oak trees supported this habitat, 16 alive and one recently dead. The Ancient Dry Bark Community was only found as a limited relic community, with the characteristic Notable *Cresponea premnea* found as small populations on six trees and no other characteristic species surviving. The Dry Bark Community is much better developed, with three Notable species found (*Chaenotheca hispidula*, *Chaenotheca stemonea* & *Lecidea nylanderii*) and two regionally uncommon species including *Chaenotheca chrysocephala*.

Acid Bark Woodland Assemblages (*Parmelion laevigatae*): distinctive communities developed on well-lit but sheltered acid bark in woodlands in oceanic areas. These typical of wet upland areas, but extend into drier but humid lowland sites, especially in larger ancient woodlands. That anything survives of this assemblage at Burnham Beeches is a surprise, it must have been near the eastern limit of the habitat and the community is vulnerable to high levels of acidifying pollution. A little does survive, however, with two Notable species recorded (*Micarea doliiformis* and *Schizotrema quercicola*) and three regionally uncommon species including *Loxospora elatina*. The interest is confined to a few Oaks deep in the woods.

Smooth Bark Communities (*Graphidetum scriptae*): communities on smooth bark of shrubs, especially Hazel and Holly, and smooth barked trees in sheltered woodland conditions. The characteristic species are common species but ancient woodland lichens occur on old Hazels and Holly, and slow growing suppressed young trees. The community typically occurs on thin and hard smooth with limited capacity to survive acidification. Limited woodland interest survives in this habitat here, but two new regionally uncommon species for the site were found in 2020 *Mycoporum antecellens* on Beech and *Stenocybe septata* on Hollies.

Terricolous Habitats: there was insufficient time to look at the surviving heathland to the south east and there could potentially be some lichen interest there. There was some development of a heathland lichen assemblage at Crabtree Heath, where a well-lit section of the outer moat bank supported some heathland lichens. Of more interest were shaded woodland assemblages on banks. The sides of the moat in Crabtree Heath was of more significant interest, with two species new to the county, which are very rare in central England: (*Cladonia caespiticia* & *Trapeliopsis gelatinosa*).

Canopy and Twig Communities and Air Pollution: the trunk communities have been damaged by past acidifying air pollution, but this has declined and the impact visible is historic damage to slow colonising communities on slow growing trees that have not yet shed acidified bark. The APIS website gives modelled ammonia levels across the NNR 1.28 – 1.63 $\mu\text{g m}^3$. This exceeds the critical level for lichens of 1.0 $\mu\text{g m}^3$. This is not impacting on the trunk communities, at least yet, but can be seen in the twig assemblages, where some nitrogen hating lichens survive but moderate nitrogen loving species are widespread. Very damaging ammonia pollution occurs at levels over about 2.0 $\mu\text{g m}^3$, when nitrogen-hating species disappear and species tolerant of high nitrogen pollution dominate, but this situation was not observed within the woods.

Management

Rare lichens typically have very low rates of occupation, as they require specialised niches found on only a few veteran trees. As a result they tend to occur on very small numbers of trees within large populations of veteran trees. They have varying demands for different degrees of shelter and light, but require combinations of both, with the result that lichen rich sites typically have an abundance of veteran trees in mosaics of open and partially open stands. Very open and very closed stands are less rich, with very little interest found on deeply shaded veteran trees. The best lichen rich tree habitat is found in extensively grazed land with both gladed grazed woodland and some more open parkland.

The lichen assemblage at Burnham Beeches NNR has been damaged mainly by external acidifying pollution, but the decline and cessation of extensive grazing will also have had a negative impact. Potentially the loss of grazing could have led the loss of much of the surviving lichen interest to deep shade, but active management by halo thinning has prevented this. Acidifying pollution has greatly declined and halo thinning around the living trees has basically saved the lichen interest that survived the acidifying pollution.

Comments on Management of Burnham Beeches NNR: the needs of lichens will need to be balanced with other requirements and practicality. Considering lichens alone the following points are made. Most of these are concerned with extent and intensity of what is already under way, and may already be planned anyway.

- **Grazing:** although this need not be as intense as it is in the New Forest, it does need to be high enough to be a check on tree regeneration, including Holly and to create a general browse line within the woods, including on Holly. This gets light on to the rich lower trunk habitat, even in quite dense stands. For this the grazing in the areas outside of the permanent fence needs to be higher.
- **Halo-thinning veteran trees:** the halo-thinning of the live veteran trees has been a life saver for the rare lichen assemblages. This treatment needs to be extended to the standing dead Oak trees. To continue to be beneficial for lichens the existing glades created halo thinning the live trees will need to be kept open to a

greater degree than if the halo thinning was only intended to reduce inter-tree completion.

- **Restructuring stands derived without grazing pressure:** regeneration occurring under grazing pressure is patchy and tends to occur in more open areas away from the larger trees. The mass regeneration that has originated since grazing stopped is far too dense. This needs restructuring to get large areas of the woodland back to the sort of structure that would have been produced if grazing had been maintained but some regeneration allowed. Just halo-thinning veteran trees alone will be insufficient to create sustainable lichen habitat. This thinning needs to be more extensive, but needs to be uneven, creating glades locally, but leaving denser stands along with damaged and poorly grown trees.
- **Extent of old growth habitat:** the area of old growth woodland is quite small compared to sites such as the New Forest. Given the small percentage of trees that rare lichens can occupy, larger areas are likely to be much more sustainable than small fragmented areas. Long term expansion of the old growth habitat is therefore very desirable. The most obvious areas for expansion are the former coppices of New Coppice and Fleet Wood. They are close to existing rich areas, are deep within the woodland complex and already have large number of younger post mature trees. They will need similar management to the existing pasture woodlands.
- **Pollards:** the role of pollards in lichen conservation is probably mainly historic. Working pollards resulted in the conservation of veteran trees in working and exploited pasture woodlands. Surveys of rare species in the New Forest, have found that there is no strong association with lapsed pollards for rare lichens on Beech. Naturally damaged maidens and leaning trees were more important habitats, probably mainly because these were more frequent in a forest where pollarding was patchy. At Burnham Beeches nearly all the old Beeches are lapsed pollards. Here the programme of partial pollarding that has been carried out is essential to extend the life of the existing oldest trees as long as possible. The loss of some significant Beeches over just three years was noted during the survey. The role of new pollards for lichen conservation is not at all clear, but new pollards should certainly be cut to maintain the traditional landscape of Burnham Beeches. Also important in providing future lichen habitat will be retaining naturally damaged, leaning trees, and suppressed slow-growing trees will also be important.

Pollution Impacts and Mitigation: air pollution has been a major impact damaging the lichen habitat in Burnham Beeches. Past acidifying pollution based on sulphur dioxide has rendered the majority of the veteran trees lichen poor. Richer trees represent trees whose bark was buffered to some degree protecting them from the impacts of acidification. Acidification has greatly declined and has been low for some decades now. Many of the veteran trees, however, are still acidified but early stages of a recovery were evident in the field. With time, more colonisation on to de-acidifying bark should occur.

Although acidification has declined, nitrogen based pollution has risen. This includes several different compounds with very different impacts on lichens. Ammonia based pollution, mainly from agricultural sources, but also from catalytic convertors in petrol engines, has major visible impacts on epiphytic lichen communities. This acts mainly through raising the pH of the bark and increasing the osmotic pressure of the water on the bark. Ammonia tolerant lichens species are those of sunny dusty habitats or coastal habitats, which face similar chemical challenges in their natural habitats. Many species of conservation concern are intolerant of these conditions, especially ancient woodland species. The background levels of ammonia in the area of Burnham Beeches are elevated and above the critical level for lichens of $1.0 \mu\text{g m}^3$ and ideally should be reduced below this.

Ammonia is a short range pollutant that is significantly scrubbed out over distances of hundreds of meters, so the centre of Burnham Beeches is likely less polluted. Solutions mainly involve national policy, however, maintaining denser woodland at the edges of the site and extending low intensity land use beyond the NNR to act as buffers would both help.

EPIPHYTIC LICHEN SURVEY OF BURNHAM BEECHES NNR BUCKINGHAMSHIRE, 2020

1.0 INTRODUCTION

1.1 Background & Brief

1.1.1 Background

Burnham Beeches in an important area of old growth pasture woodland, with associated heathland, which is both an SSSI & an SAC (**Map 1**). The pasture woodland is noted for frequent ancient Beech pollards. The common appears to have been heavily grazed into the early 20th century, with limited regeneration occurring. In the latter part of the 20th century the grazing ceased and there was a great deal of infill of the previously open pasture woodland and loss of open heathland has occurred. Beech and Hornbeam old growth woodlands have distinctive lichen assemblages, which in Britain survive best in the New Forest. The New Forest supports a mixture of continental Beech specialist lichens and southern oceanic species, which is distinctive in a European context. Due to past acidifying pollution there are few other examples of this rare assemblage surviving in Britain. Only Ebernoe Common, West Sussex (a Beech site) and Hatch Park, Kent (a Hornbeam site) are reasonably intact. At Burnham Beeches the impact of past acidifying pollution was high but relics of this Beech – Hornbeam assemblage survived. In particular, *Pyrenula nitida* VU (NR/S41) was known to survive on two Beech trees, but one of these had died some time ago and the other was now dying. Some translocations had been made from the first dead tree in 2001. Otherwise extant populations are only recorded from 11 New Forest woods, where it ranges from rare to frequent. By the 2010s the species was thought to have been reduced to a single tree, which by 2018 was dying.

In 2018 Plantlife contracted Neil Sanderson, Botanical Survey & Assessment, to visit the site with Dave Lamacraft (Plantlife) to review the condition of the *Pyrenula nitida* population and suggest potential actions (Sanderson, 2018a), specifically regarding translocation of a population threatened by death of a veteran beech. As part of this a reconnaissance survey was made in a nearby section of the NNR, which found that relic Beech assemblages were far richer than had been realised, with several more live Beeches supporting *Pyrenula nitida*. In addition, a remarkable number of new records were made, including eight new vice-county records. Many of these were characteristic lichens of oceanic old growth Beech wood. These included *Scutula circumspecta* (*Bacidia circumspecta*) VU (NS/S41) on two Beech pollards, new to central and eastern England, as were *Agonimia flabelliformis* Nb (NR), *Lecanora jamesii*, *Mycoporum antecellens*, *Normandina acroglypta*, *Opegrapha corticola* Nb (IR), and *Thelopsis rubella*. *Sporodophoron cretaceum* (*Schismatomma cretaceum*) Nb (IR) is rare in the same area and was new to Burnham Beeches and the county. A further visit to translocate material from the original dying Beech tree added yet more *Pyrenula nitida* trees and a small colony of material matching *Pyrenula nitidella* Ex (NR), new to Burnham Beeches and, until recently, thought extinct in Britain (Sanderson, 2019).

The results of these reconnaissance visits exceeded expectations and indicated that there is a major survival of a significant relic oceanic Beech lichen assemblage at Burnham Beeches. Further survey was recommended to determine the full extent and level of interest at Burnham Beeches (Sanderson, 2018a)

1.1.2 Brief

Plantlife contracted Neil Sanderson, Botanical Survey & Assessment, carryout a full survey of the epiphytic lichen assemblage of Burnham Beeches NNR and produce a report detailing the lichen interest of Burnham Beeches. This survey was funded under the Back from the Brink project Ancients of the Future. The primary object was to record the species of conservation interest on the veteran trees.

2.0 METHODS

2.1 Survey Methods

2.1.1 Timing & Conditions

The survey was carried out over four days in early summer: 5th, 9th & 22nd June, and 7th July. The surveys were carried out later than had been intended due to COVID-19 restrictions. During all visits the weather was dry and sunny and reasonable for lichen survey.

2.1.2 Areas Surveyed

The survey route taken by Neil Sanderson is shown on an OS map base (**Map 3**) and on Google Earth (**Map 4**) as derived from the track logs of a GPS receiver. The density of species recording is shown on **Map 15**.

The survey centred on the old pasture woodlands with veteran trees but younger former coppices (New Coppice and Fleet Wood, **Map 2**) were also sampled to confirm the lower level of lichen interest here. For reporting purposes, recording compartments were used, which were based on the discrete areas of lichen interest found. These are described below (**Map 2**):

- **Valley east of Lord Mayors Dive:** the south eastern area of ancient pasture woodland based on the valley with Upper and Middle Ponds. This has fewer, mainly shaded, old Beeches than the woods to the north but does have a scatter of standing dead Oaks, which proved to be significant. These are large set in large areas of younger infill. There was also some lichen interest in old gravel pits.
- **Seven Ways Plain:** the plateau between the two main valleys. Has much more open pasture woodland than the other areas and grazing has been revived here for longest. Both veteran Beech and Oak are frequent, but Oak is more significant here.
- **Victoria Drive Valley & Mendelssohn's Slope:** the core of the site along the largest central valley. Numerous veteran Beech, mostly in maintained glades,

with infill between. Grazing has recently been revived here. Veteran Oak is more limited as a habitat in this area.

- **Pumpkin Hill:** the slopes include groves of lichen rich Beech similar to those on Mendelssohn's Slope but there are also more veteran Oaks of interest than in the main valley. Largely young infill, with few veterans higher up.
- **Crabtree Heath:** the northern plateau with open groves of veteran Beech and Oak set in younger infill along with some areas of open heathy habitat. The Beech is rich in the most sheltered areas, along with alive and standing dead Oak of lichen interest. The banks of an old moat are also of some lichen interest
- **Egypt Woods:** includes some rich sheltered veteran Beech by The Nile, but mostly more exposed groves of more exposed species poor veteran Beech on the north eastern plateau, but with more interest Oaks, both alive and standing dead trees.

2.1.3 Recording Trees of Interest

The locations of trees particular interest supporting rare species were recorded systematically (see section 2.1.4 for definition). These were located as waypoints using a GPS receiver (**Maps 5 – 14 & 17 – 64**). These were intended to allow the mapping of species, assemblage and habitat distributions and the conservation interest across the common. The waypoints were recorded when the indicated accuracy was about ± 5 m or less.

The codes used for the waypoints were BUB and then a sequential waymark number, e.g. BUB001 etc. 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 programme QGIS, where it was mapped on to royalty free OS mapping and OS landline data supplied under licence by the City of London.

For each tree recorded, the tree species, physiological age and habitat was noted.

In addition the TomBio plug for QGIS was used to map a wider range of interesting species on a 10m grid and overall recording density for all species and species of interest on a 100m grid (**Maps 15 & 16**).

2.1.4 Species Recording

All epiphytic lichen species and associated fungi visible from the ground were recorded (**Annex 2**). In addition, the rare moss *Zygodon forsteri* EN (NR/S41) was treated as an honorary lichen and recorded in addition. As such the concentration was on the lower trunk habitats, especially on older trees and bushes, particularly in sheltered areas, the typical habitat of species of conservation interest. Habitats that contribute considerably to the lichen diversity, but are normally dominated by commonplace species, such as twigs and branches, inevitably were not so closely examined. As a result, the species list produced will not be complete but epiphytic species of nature conservation interest will have been more thoroughly recorded.

Work in Sweden has shown that surveying the bottom 2m of trunks of the fallen trees only recorded about a quarter of the lichens species of conservation interest on the whole trunk (Fritz, 2009). However, he found that most of the missed species of interest could be found within 2m of the ground on other trees within the site if an extensive survey was carried out. This indicates that extensive ground based surveys will be likely to adequately sample the total flora of lichens of conservation interest, but could significantly underestimate populations size.

Twigs are rapidly colonised by highly mobile species and this can be informative. The composition of the lichen assemblage on the twigs gives an indication of the recent air chemistry, which is not confused by residual effects of past pollution as can occur on trunks (Wolseley et al, 2006). Oak is the best species to observe this, both because of its widespread distribution and its naturally acid bark allows the clear expression of current nitrogen pollution. Where possible the lichen assemblage of Oak twigs was checked to estimate current air pollution levels.

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 a six-figure grid reference accuracy. No attempt was made to identify members of the difficult *Lepraria incana* sens. lat. other than the distinctive *Lepraria finkii*. All Threatened, Near Threatened and most Notable species recorded were recorded to at least an eight figure accuracy (exceptions were for *Porina byssophila* Nb (NS) and *Strigula taylorii* Nb (NS/IR), which are not easy to record and were quite widespread).

A selection of species, which included all national Threatened or Near Threatened RDB species, the more easily recorded Notable species and some other species of ecological significance, were systematically mapped.

All trees with the systematically recorded species were located using a GPS receiver and mapped as a broad brush monitoring exercise (**Maps 3 – 14 & 17 – 64 & Annex 1**). For these species the frequency of occurrence was estimated as D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare. In addition, on these trees, all additional species of conservation interest present were also noted.

Systematically Recorded Species:

Species	Conservation Status	Habitats
Lichens		
<i>Agonimia flabelliformis</i>	Nb (NR) s	Flushed bark
<i>Anisomeridium ranunculosporum</i>		Acid bark
<i>Bellicidia incompta</i>	VU (NS/S41)	Wound track
<i>Chaenotheca brunneola</i>	s	Lignum
<i>Chaenotheca chrysocephala</i>	s	Dry bark
<i>Chaenotheca hispidula</i>	Nb (NS) s	Dry bark & Lignum
<i>Chaenotheca stemonea</i>	Nb (NS) s	Dry bark
<i>Chaenothecopsis nigra</i>	Nb (NS)	Lignum (dry bark)
<i>Cladonia incrassata</i>	Nb (NS)	Lignum

<i>Coenogonium tavaresianum</i>	Nb (NR)	Flushed bark
<i>Cresponea premnea</i>	Nb (IR) s	Dry bark
<i>Lecanora jamesii</i>	s	Flushed bark
<i>Lecidea nylanderii</i>	Nb (NS)	Lignum (acid bark)
<i>Microcalicium ahlneri</i>	Nb (NS)	Lignum (dry bark)
<i>Micarea doliiformis</i>	Nb (NS)	Acid bark
<i>Mycoporum antecellens</i>	s	Smooth bark
<i>Opegrapha corticola</i>	Nb (IR)	Flushed bark
<i>Pachyphiale carneola</i>	s	Flushed bark
<i>Pertusaria pustulata</i>	VU (NR)	Flushed bark
<i>Porina hibernica</i>	NT (NS/IR/S41) s	Flushed bark
<i>Porina multipuncta</i>	r	Flushed bark
<i>Pyrenula nitida</i>	VU (NR/S41)	Flushed bark
<i>Pyrenula nitidella</i>	Ex (NR)	Flushed bark
<i>Rinodina roboris</i> var. <i>roboris</i>	Nb (IR)	Flushed bark
<i>Scutula circumspecta</i>	VU (NS/S41)	Flushed bark
<i>Scytinium subtile</i>	Nb (NS)	Wound track
<i>Stenocybe septata</i>	Nb (IR) s	Smooth bark
<i>Thelopsis rubella</i>	s	Flushed bark
Bryophytes		
<i>Zygodon forsteri</i>	EN (NR/S41)	Wound track

Site notes were made on an iPhone in the field and the field notes have been edited and added to the report in **Annex 1**. The species recorded are given in **Species List 2, Annex 2** and the data was converted into a BLS Recorder import spreadsheet <BLS_General_v6f Burnham Beeches 2020.xlsx> to allow importation into the BLS database, these will later be available on the NBN.

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

2.2 Data Analysis

2.2.1 Nomenclature

The nomenclature mainly follows Sanderson et al (2018) for lichens and lichenicolous fungi but includes changes accepted by the BLS taxon dictionary since then up to

October <<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>Agonimia flabelliformis</i>	<i>Agonimia allobata</i> s. lat.
<i>Bacidina adastr</i>	<i>Bacidia adastr</i>
<i>Bacidina phacodes</i>	<i>Bacidia phacodes</i>
<i>Bellicidia incompta</i>	<i>Bacidia incompta</i>
<i>Brianaria bauschiana</i>	<i>Micarea bauschiana</i>
<i>Candelariella xanthostigmoides</i>	<i>Candelariella reflexa</i>
<i>Coniocarpon cinnabarinum</i>	<i>Arthonia cinnabarina</i>
<i>Dendrographa decolorans</i>	<i>Schismatomma decolorans</i>
<i>Diarthonia spadicea</i>	<i>Arthonia spadicea</i>
<i>Erythricium aurantiacum</i>	<i>Marchandiomyces aurantiacus</i>
<i>Lepraria finkii</i>	<i>Lepraria lobificans</i>
<i>Pachnolepia pruinata</i>	<i>Arthonia pruinata</i>
<i>Porina multipuncta</i>	<i>Opegrapha multipuncta</i>
<i>Schizotrema quercicola</i>	<i>Schismatomma quercicola</i>
<i>Scutula circumspecta</i>	<i>Bacidia circumspecta</i>
<i>Scytinium subtile</i>	<i>Leptogium subtile</i>
<i>Sporodophoron cretaceum</i>	<i>Schismatomma cretaceum</i>

2.2.2 Ancient Woodland Indicators

Dr Francis Rose (Rose, 1992 & Coppins & Coppins, 2002a) devised several indicator lists that can be used to assess the diversity and conservation value of woodland epiphytic lichen assemblages in different climatic areas. These replaced an earlier more general indicator list the 'Revised Index of Ecological Continuity' (RIEC) Rose (1976). The indices are ideally applied to about 100ha of woodland. The indices were recently reviewed (Sanderson, 2018b), mainly with the aim of simplifying the application of the indices, by removing multiple choices. The thresholds for considering sites for SSSIs were also reviewed and updated in preparation for the updated SSSI selection criteria for lichens (Sanderson et al, 2018). Some minor changes were also made to the species used. To reflect the changes, the indices were given new and more informative names.

These lists indicate habitat quality; the total number of species found is the important parameter. The indicator species are associated with late succession stands with veteran trees (old growth stands i.e. stands more than 200 years old), especially those stands with a past continuity of old trees (Alexander et al, 2002). Woods that have been clear felled, but regenerated, within the last 200 years (young growth stands) are therefore likely to be poorer in lichen indicator species than less disturbed stands. The lichen ancient woodland indicator lists are different from similar ancient woodland indicator lists composed of vascular plants or bryophytes. The latter reflect ancient sites rather than stands and are much less effected by the management of the trees.

The appropriate list for Buckinghamshire is the Southern Oceanic Woodland Index (SOWI) (formerly the New Index of Ecological Continuity, NIEC). This is designed for oceanic temperate woodland south of the Scottish Highlands. A new index, the Pinhead Lichen Index is also relevant.

- **Southern Oceanic Woodland Index (SOWI):** applies to oceanic temperate woodland south of the Scottish Highlands. Sanderson (in press a) regarded sites with an index score of 20 or more as being national significance, while sites with scoring more than 30 are regarded to be as likely to be of international significance. Such woods are usually old growth stands with a strong continuity of veteran trees. In Buckinghamshire, it is recommended that a score of 20 be used as the threshold for considering sites for SSSI status (Sanderson et al, 2018). Sites with 10 – 19 can be regarded as of county importance.
- **Pinhead Lichen Index (PLI):** for this index the total number of recorded Pinhead species in the genera *Calicium*, *Chaenotheca*, *Chaenothecopsis*, *Microcalicium*, *Mycocalicium* and *Sclerophora* is used as an index score. This index measures the quality of ancient tree and dead wood habitat, sites scoring more than ten are can be regarded as being of national importance and this is also the threshold for considering sites for SSSI status. Sites with 5 – 10 can be regarded as of county importance.

2.2.3 Rarity & Threat

The definitions of Red Data Book (RDB) status follows Woods & Coppins (2012), who also added a concept of International Responsibility Species:

- **International Responsibility Species:** this is a new category that recognises that some species are commoner in Britain than elsewhere. They are absent, rare or threatened in the rest of Europe and are thought, on existing data, to have 10% or more of their European or World population in Britain. These could be considered as more important than some Red Data Book species, which are common elsewhere in the world. The significance of these species depends on their actual British and local rarity but special attention needs to be paid to them in management.

The Nationally Rare and Nationally Scarce status in Woods & Coppins (2012) are now out of date but updated assessments are given in Sanderson et al (2018)

Significant populations of threatened species (Vulnerable or higher) or Near Threatened species, which are also International Responsibility species either nationally or within SSSI areas of search can be considered as nationally significant and as potentially notifiable features of an SSSI (Sanderson et al, 2018).

Notable Species. Sanderson (2018c) has reviewed the measurement of rarity for species not assessed as threatened, or as Near Threatened, species in the RDB. Many declining lichens or those restricted to vulnerable habitats, which are Nationally Scarce, have now been assessed as Threatened or Near Threatened lichen species. In contrast, several ephemeral Nationally Rare species of ruderal habitats are now assessed as least concern. As such the old Nationally Rare/Nationally Scarce assessment was not thought useful any more. As an alternative Sanderson (2011) proposed that all Least Concern or Data Deficient species which were Nationally Rare

Nationally Scarce or International Responsibility species be put in a single category "Notable species" (Nb). Sanderson (2018c) reviewed the potential Notable species and excluded those that were clearly under-recorded common species or ruderal species of limited conservation interest. This list is given in Sanderson (2018c) and is followed in this report.

Sanderson (2018c) suggested an alternative scoring system to that of Hodgetts (1992) (Threatened, Near Threatened and Notable (TNTN) scoring). The score is calculated as follows:

GB Threatened (CR, EN, VU) – scores 4 points.

GB Near Threatened – scores 2 points.

Notable – scores 1 point.

None of the above – scores nil.

This scoring system can be used in woodland habitats, but is considered less useful than the woodland indices in this habitat and is recommended mainly for habitats lacking suitable habitat indices. It is not adopted by Sanderson et al (2018) as a priority method of assessing woodland but is still useful for comparing the conservation interest of sites.

Section 41 Species. 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".

The BAP list was revised (Biodiversity Reporting and Information Group, 2007) and, unlike the earlier list, is a reasonably comprehensive list of those lichen species likely to be under particular stress and amenable to conservation action to reverse this. Conservation of these species is regarded as being an important contribution to Britain's obligations under the Rio Convention on Biodiversity. Collectively, however, the Section 41 species list is not an objective tool for assessing conservation importance, habitat indices, RDB populations and the list of Notable species provide this.

Abbreviations used in the text and tables are listed below:

RDB	= Red Data Book Species, (CR, EN, VU & NT Species)
Ex	= Regarded as Extinct in Britain by Woods & Coppins (2012), since rediscovered
VU	= Vulnerable Red Data Book species
NT	= Near Threatened Red Data Book species
Nb	= Notable species (NR, NS, IR or S41 species of conservation interest not RDB NT or higher)
NR	= Nationally Rare
Nb (NS)	= Nationally Scarce regarded by Sanderson (2018c) as being of significant conservation interest

- (NS) = Nationally Scarce lichen not regarded by Sanderson (2018c) as being of significant conservation interest
 [NS] = Nationally Scarce lichenicolous fungus not included in Smith et al (2009) and likely to be very under recorded
 IR = International Responsibility species
 S41 = Section 41 species

A Lichen Red Data List for England.

A lichen Red Data List for England, is in initial draft. The differences with the national red list reflect that some species that have stronger populations in Scotland or Wales, but are threatened further south. At Burnham Beeches three species have been recorded that are regarded as being of Least Concern in Britain as a whole but are listed as potentially Near Threatened in England: *Chaenotheca stemonea*, *Chaenothecopsis pusilla* and *Microcalicium ahlneri*.

2.2.4 Communities

Most lichens species have limited tolerances for bark and habitat conditions. This allows the formation of distinctive communities (James et al, 1977). Simple English names have been invented with the technical names given in brackets.

2.2.5 Mapping the Quality of Lichen Interest

The conservation interest of the lichen flora at the waypoints was assessed and mapped, with different symbols assigned to different levels of interest in QGIS (**Map 6 & 8**).

Purple: location with systematically British RDB Vulnerable or higher species.

Red: location with systematically British RDB or provisional English Near Threatened species.

Blue: location with other systematically recorded British Notable species.

Green: other species of ecological significance

2.2.6 Existing Data

An excel spreadsheet with existing lichen data recorded from Burnham Beeches was obtained Janet Simkin, the Data Officer of the British Lichen Society. The data from this is incorporated into **Species List 1, Annex 2**. This has rather limited data, with few species of interest recorded. In the period between 1960 – 2001 there were records from Francis Rose 1968, Humphrey Bowen 1986, William Purvis 1989 and Simon Davey 2001. The species of interest recorded were:

Species	Conservation Status	Date	Recorder
<i>Bacidia friesiana</i> •	Nb (NS)	1970 - 1980	William Purvis
<i>Calicium salicinum</i> •		1968	Francis Rose
<i>Calicium viride</i> •		1968	Francis Rose
<i>Chaenotheca chrysocephala</i> (•)		1970 - 1980	William Purvis
<i>Chaenotheca ferruginea</i>		1968	Francis Rose
<i>Chaenotheca ferruginea</i>		10/06/01	Simon Davey
<i>Chaenothecopsis pusilla</i>	Nb (NS)	10/06/01	Simon Davey*

<i>Cladonia parasitica</i>		1968	Francis Rose
<i>Cresponea premnea</i> (•)	Nb (IR)	1960 - 1970	Francis Rose
<i>Loxospora elatina</i> •		1960 - 1970	Francis Rose
<i>Pyrenula nitida</i>	VU (NR/S41)	1968	Francis Rose
<i>Pyrenula nitida</i>	VU (NR/S41)	1970 - 1980	William Purvis
<i>Pyrenula nitida</i>	VU (NR/S41)	1989	William Purvis
<i>Pyrenula nitida</i>	VU (NR/S41)	10/06/01	Simon Davey
<i>Schismatomma quercicola</i>	Nb (IR)	10/06/01	Simon Davey
<i>Thelotrema lepadinum</i>		1968	Francis Rose
<i>Thelotrema lepadinum</i>		01/02/86	Humphrey Bowen
<i>Thelotrema lepadinum</i>		10/06/01	Simon Davey

• = Not seen this century

(•) = Not seen this century, but refound in this survey

* = Determined by B. J. Coppins

The BLS data also contains some data from the 1920s, this included *Pertusaria pustulata* VU (NR), a Beech specialist that certainly could have occurred but was much miss-recorded in the past. Some old records are not clear, as to identity, location or are likely to be from other habitats (see below **Species List 1, Annex 2**). Excluding those, a total of 89 species have been recorded between 1923 and 2001. These species score seven in the Southern Oceanic Woodland Index (SOWI) and six in the Pinhead Lichen Index (PLI) and included two species now assessed as Vulnerable and four Notable species.

In addition a report of an informal lichen meeting to Burnham Beeches by Mark Powell in 2016 is available. The species list from this survey has also been added to **Species List 1**. This meeting concentrated mainly on the younger trees, but did record some interest from the older trees, especially the Oak. New species of interest recorded in 2016 were *Bacidia incompta* VU (NS/S41) and *Porina byssophila* Nb (NS) on Beech and *Chaenotheca stemonea* Nb (NS), *Chaenothecopsis nigra* Nb (NS) and *Lecidea nylanderii* Nb (NS) on Oak along with refinds of *Chaenotheca hispidula* Nb (NS), *Porina borrieri* Nb (NS) and *Microcalicium ahlneri* Nb (NS). The 2016 survey covered the common species well, especially those recolonising twigs and young trees, so the later surveys by Sanderson and Lamacraft, concentrated on the veteran trees. As well as the two visits by Sanderson and Lamacraft (Sanderson, 2018a & 2019), Dave Lamacraft recorded additional species the day after Sanderson (2019) on 3rd April 2019. The data from all these recent visits is incorporated into the data used in this report.

Latterly, additional records from some fixed quadrat monitoring set up by William Purvis has come to light (data held by City of London) and records of more notable species have been incorporated into the report.

3.0 SURVEY

3.1 Lichen Assemblage

3.1.1 Totals

The combined lichen and associated fungi species list recorded from the 1920s to 2020 is given in **Species List 1** in **Annex 2**. A total of 174 taxa have been reliably recorded from natural habitats in the NNR. Of these 158 were lichens, nine lichen parasites and seven associated non-lichenised fungi. Seven lichens were terricolous, all the others were recorded from the trees. Since 2016, 151 taxa were recorded, with the 2018 – 20 survey recording 121 taxa from Burnham Beeches (**Species List 2** in **Annex 2**). Many taxa recorded 2018 – 2020 were new to the NNR, with 26 new vice-county records. A total of 23 taxa recorded prior to 2016 have not been refound recently.

Epiphytic species of interest recorded from the reserve included 21 Southern Oceanic Woodland Index (SOWI) species, of which 19 were recorded in 2020. The Pinhead Lichen Index scores 13 for all data and 10 for 2020. Of Threatened and Notable species one lichen thought to be Extinct until recently was found, along with four Vulnerable, one Near Threatened and 21 Notable species. Only three notable species were not refound during the 2018 – 2020 survey. The overall totals are listed in **Table 1**. The post 2016 totals of species of interest are far higher than the totals recorded before 2016.

TABLE 1
Total Biodiversity Measures for Lichens Burnham Beeches NNR, 1923 – 2020

Biodiversity Measure\Date	All	1923 – 2001	2016 – 20	2016	2018 – 20
Total taxa	174	89	151	85	121
Southern Oceanic Woodland Index score	21	7	19	6	19
Pinhead Lichen Index score	13	6	10	5	10
Extinct (recently refound)	1	0	1	0	1
Vulnerable	4	2	4	1	4
Near Threatened	1	0	1	0	1
Notable	20	4	17	7	17
International Responsibility Species	7	2	6	0	6
Section 41 species	4	1	4	1	4
TNTN score	40	12	37	11	37

As well as finding more populations of the known *Pyrenula nitida* VU (NR/S41), the 1926 record of *Pertusaria pustulata* VU (NR) was refound and four very rare species were found that were new to the site since 2016. These were *Bellicidia incompta* (*Bacidia incompta*) VU (NS/S41), *Scutula circumspecta* (*Bacidia circumspecta*) VU (NS/S41), *Porina hibernica* NT (NS/IR/S41) and *Pyrenula nitidella* Ex (NR). Other new species of significance included old woodland or veteran tree specialists included *Agonimia flabelliformis* Nb (NR), *Chaenotheca brachypoda* Nb (NS), *Chaenotheca hispidula* Nb (NS), *Chaenotheca stemonea* Nb (NS), *Chaenothecopsis nigra* Nb (NS),

Coenogonium tavaresianum Nb (NR), *Lecidea nylanderii* Nb (NS), *Micarea doliiformis* Nb (NS), *Opegrapha corticola* Nb (IR), *Pachyphiale carneola*, *Rinodina roboris* var. *roboris* Nb (IR), *Stenocybe septata* Nb (IR) *Scytinium subtile* (*Leptogium subtile*) Nb (NS), *Sporodophoron cretaceum* Nb (IR), and *Thelopsis rubella*.

Species of interest recorded previously but not refound, include only four species of conservation interest (last date of recording): *Bacidia friesiana* Nb (NS) (1988), *Chaenothecopsis pusilla* Nb (NS) (2001), *Pertusaria multipuncta* (2001) and *Schizotrema quercicola* Nb (IR) (2001).

The totals recorded between 2018 and 2020 in the lichen survey areas (**Map 2**) are listed in **Table 2**. These show great variation across the site, with the two areas of greatest interest being Victoria Drive Valley & Mendelssohn's Slope and Crabtree Heath. Pumpkin Hill and Egypt Woods are also of interest with lower levels of interest seen in Seven Ways Plain and the lowest interest in the valley east of Lord Mayors Dive. This reflects the two main habitats of lichen interest found in the NNR in 2020. Sheltered non-acidified Beeches support a remarkable and rich relic assemblage of Beech specialist communities on flushed bark along with some similar base rich bark assemblages on a few associated Oaks. Wound tracks are an additional associated habitat. This habitat is richest in Victoria Drive Valley & Mendelssohn's Slope with significant survival in Pumpkin Hill and Crabtree Heath. The wound track assemblage also occurs in Egypt Woods but with limited survival of the other non-acidified flushed habitats.

The second main habitat is dry bark on ancient Oaks and lignum exposed on live old Oak and on standing dead trees. This is less species rich overall than the flushed bark and wound track habitats. The assemblage is rare in Victoria Drive Valley & Mendelssohn's Slope but is well developed in Seven Ways Plain, Crabtree Heath and Egypt Woods. Some largely dead Oaks of interest were also found in the valley east of Lord Mayors Dive. The combination of the occurrences rich examples of either of these broad habitats determines the overall interest. Very locally there also were some regionally uncommon species on the ground on old banks and in gravel pits in Crabtree Heath and the valley east of Lord Mayors Dive.

TABLE 2
Total Biodiversity Measures for Lichens Burnham Beeches NNR, 2018 – 2020

Biodiversity Measure\Date	2018 – 20	ELMD	SWP	VVMS	PH	CTH	EW
Total taxa	121	82	52	72	40	28	18
Southern Oceanic Woodland Index score	19	2	7	12	8	10	7
Pinhead Lichen Index score	10	4	8	3	3	7	5
Extinct (recently refound)	1	0	0	1	0	1	0
Vulnerable	4	0	0	3	2	3	1
Near Threatened	1	0	0	1	0	0	0
Notable	17	5	5	9	6	14	8
International Responsibility Species	6	0	0	5	2	5	4
Section 41 species	4	0	0	4	2	2	1

TNTN score	37	5	5	25	14	30	12
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- ELMD = Valley east of Lord Mayors Dive
 SWP = Seven Ways Plain
 VVMS = Victoria Drive Valley & Mendelssohn's Slope
 PH = Pumpkin Hill
 CTH = Crabtree Heath
 EW = Egypt Woods

The former coppices of New Coppice and Fleet Wood (**Map 2**) were looked at by transects and looping into the edges when surveying adjacent pasture woodland areas (**Map 3**). Old woodland lichens were found only once when the relatively mobile *Thelotrema lepadinum* (SOWI species) was found a short way into Fleet Wood adjacent to Crabtree Heath on a mature Oak (SU9497 8557).

3.1.2 Lichen Assemblages and Communities of Interest

Although many lichen rich trees and locations were found in 2018 – 20 within Burnham Beeches, there are also large numbers very lichen poor veteran trees and areas with old trees but limited lichen interest. Beech outside of more sheltered areas is particularly species poor and many veteran Oaks are also barren. Most of these are trees that lost their lichen interest due to past acidification from air pollution and have not yet recolonised. Among these are scattered veteran trees with lichen interest. These can vary from isolated trees with a few relic patches of veteran tree specialist lichens to trees with a high cover of nearly intact communities of conservation interest in groups of lichen rich trees. The impact of acidifying pollution was most likely proportional to the buffering capacity of bark of the individual trees, but with different degrees of shelter also an important factor. The most sheltered areas in the large central valley (Victoria Drive Valley & Mendelssohn's Slope & the lower slopes of Pumpkin Hill) supports large numbers of lichen rich Beech (**Map 6**), with a second area of sheltered rich Beech in Crabtree Heath. Otherwise Beech of interest is mainly confined to a scatter of veteran Beeches with the wound track moss *Zygodon forsteri* EN (NR/S41) in the more exposed Egypt Woods. Beeches in even more exposed locations such as Seven Ways Plain are very species poor.

Oak bark has greater buffering capacity (to acidification) than Beech and some Oaks in more open locations support lichen interest, especially dry bark communities but also with rare acid bark and base rich bark assemblages. In addition, exposed lignum is a special habitat found on veteran trees and standing dead trees, which also supports lichen interest, which has recovered from pollution more rapidly than the bark habitats (Sanderson, 2018c). Oaks of lichen interest are much more widely dispersed than Beech (**Map 7**). The main concentrations of Oak of interest mostly do not overlap with the core areas of lichen rich Beech.

The trunk communities have been damaged by past acidifying air pollution, but this has declined and the impact visible is historic damage to slow colonising communities on slow growing trees that have not yet shed acidified bark. Modern air pollution at Burnham Beeches is dominated by high nitrogen deposition especially ammonia. The APIS website <<http://www.apis.ac.uk>> gives the model ammonia levels

at Burnham Beeches at $1.28 - 1.63 \mu\text{g m}^3$. This exceeds the critical level for lichens of $1.0 \mu\text{g m}^3$. This is not impacting on the trunk communities, at least yet, but can be seen in the twig assemblages, where some nitrogen hating lichens survive but moderate nitrogen loving species are widespread. Very damaging ammonia pollution occurs at levels over about $2.0 \mu\text{g m}^3$, when nitrogen-hating species disappear and species tolerant of high nitrogen pollution dominate, but this situation was not observed within the woods.

The lichen species of conservation interest are found in several habitats, with distinct distributions within the common. The communities or assemblages contributing to the lichen interest are described below. The most frequent habitats are assemblages on flushed higher pH (base rich) bark on veteran trees, mainly Beech but rarely Oak (**Map 9**, 35 trees). This is an a mixture of several communities that would probably be considered separately in a less damaged lichen rich Beech wood but are most simply lumped together in this account. These include the Base Rich Bark Woodland Community (*Agonimion octosporae*), Flushed Mesic Bark Community (*Pyrenuletum nitidae*) and the Mature Mesic Bark Community (*Pertusarietum amarae*). Closely associated with this assemblage are Wound Tack Assemblages (*Gyalectinetum carneoluteae*) (**Map 10**, 21 trees).

The other main habitats are lignum (Dry Lignum Community, *Calicium abietinae* & Damp Lignum *Cladonietum coniocraeae*) and dry bark (Ancient Dry Bark Community *Lecanactidetum premneae* and Dry Bark Community *Calicium hyperelli*) habitats, which share some species but also support specialists to both habitats. The lignum habitats are more widespread (**Map 11**, 35 trees), with more localised dry bark habitats (**Map 12**, 16 trees). More minor relic communities support species of interest including fragments of Acid Bark Woodland Communities (*Parmelion laevigatae*) (**Map 13**, six trees) and Smooth Bark Communities (*Graphidetum scriptae*) (**Map 14**, four trees). The lichen assemblages are described in more detailed below.

Flushed Base Rich Bark on Veteran Trees (*Agonimion octosporae*, *Pyrenuletum nitidae* & *Pertusarietum amarae*): found on less acid flushed bark veteran trees, mainly Beech here but rarely on Oak in sheltered parts of the site (**Map 9**). These communities are largely direct survivors from pre-pollution communities, which were protected by higher pH stem flows from the impact of acidifying pollution. There has been a clear recovery on some trees with rare species, including *Pyrenula nitida*, colonising on to bark than had been acidified in the 20th century. Colonisation on to new trees is much rarer and mainly seen in the middle section of the central valley by Burnham Walk, and mostly by the most nationally widespread species. Exceptions to this were two instances of probably *Pyrenula nitida* colonising on to suppressed slow growing young Beeches. In 2020, four Beeches out of 29 supporting interesting examples of this assemblage were dead, two having died since 2018.

A total of 25 species of conservation interest were recorded from this habitat, all of which were found in 2018. These include one species recently thought Extinct, three Vulnerable, one Near Threatened species and eight Notable species, along with 12 regionally rare or uncommon species.

The richest community with this assemblage, the Base Rich Bark Woodland Community (*Agonimion octosporae*) is dominated by crust-forming species and occupies strongly flushed base rich bark. It is a southern oceanic community that replaces the more north western *Lobarion*, dominated by leafy lichens, in shaded humid woods in oceanic Mediterranean and southern Atlantic climates. The *Lobarion* community almost certainly once existed at Burnham Beeches but is very acid pollution intolerant and will have been long lost. Characteristic *Agonimion octosporae* species found at Burnham Beeches include *Agonimia flabelliformis*, *Coenogonium tavaresianum*, *Opegrapha corticola*, *Porina hibernica*, *Sporodophoron cretaceum*, *Rinodina roboris* var. *roboris* and *Thelopsis rubella*. Other species include *Scutula circumspecta* (*Bacidia circumspecta*) *Normandina acroglypta* and *Pachyphiale carneola*. Many of these were found new to Burnham Beeches in 2018 – 2020 and all are at least regionally rare. Some such as *Porina hibernica* and *Scutula circumspecta* rare in Britain.

In less frequently flushed bark on the veteran trees, the Base Rich Bark Woodland Community grades into Flushed Mesic Bark Community (*Pyrenuletum nitidae*) (wetter) and then the Mature Mesic Bark Community (*Pertusarietum amarae*) (drier). The wetter end of this transition is marked by *Pyrenula* species (*Pyrenuletum nitidae*), associated with *Coniocarpon cinnabarinum* and *Enterographa crassa* along with some more general wound track species such as *Porina borneri*, *Porina byssophila* and *Strigula taylorii*. As well as the common oceanic *Pyrenula chlorospila*, two very special species of Burnham Beeches are the more sub-oceanic *Pyrenula nitida* and *Pyrenula nitidella*, which are very rare in England, with the latter thought to be extinct in Britain until recently.

In drier examples, the *Pyrenula* species are replaced by *Pertusaria* species the Mature Mesic Bark Community (*Pertusarietum amarae*). This would have been very extensive on the Beeches in this site but as it is drier it was less well protected from acidification than the wetter bark communities and is rather uncommon now. Rare species are less prominent in this community but include *Pertusaria pustulata*, a very rare species, refound in 2020 after a single record from Burnham Beeches in 1926, along with regionally rare species such as *Dactylospora parasitica* (parasitising *Pertusaria hymenea*), *Lecanora jamesii*, *Pertusaria flavida* and *Thelotrema lepadinum*.

This is an impressive assemblage for a site that was thought to have little lichen interest surviving, but compared to the New Forest assemblage (Sanderson, 2010), they are many species missing here that may have been lost from the site due to the last century or so of acidifying pollution.

Flushed Base Rich Bark on Veteran Trees (*Agonimion octosporae*, *Pyrenuletum nitidae* & *Pertusarietum amarae*):

Species	Conservation Status	2018 – 20
<i>Agonimia flabelliformis</i> •	Nb (NR)	1
<i>Bacidina phacodes</i>		1

<i>Coenogonium tavaresianum</i>	Nb (NR)	1
<i>Coniocarpon cinnabarinum</i>		1
<i>Dactylospora parasitica</i>	[NS]	1
<i>Enterographa crassa</i>		1
<i>Lecanora jamesii</i> •		1
<i>Normandina acroglypta</i>		1
<i>Opegrapha corticola</i> •	Nb (IR)	1
<i>Pachyphiale carneola</i> •		1
<i>Pertusaria flavida</i>		1
<i>Pertusaria pustulata</i>	VU (NR)	1
<i>Porina borrieri</i>	Nb (NS)	1
<i>Porina byssophila</i>	Nb (NS)	1
<i>Porina hibernica</i> •	NT (NS/IR/S41)	1
<i>Porina multipuncta</i>		1
<i>Pyrenula chlorospila</i>		1
<i>Pyrenula nitida</i>	VU (NR/S41)	1
<i>Pyrenula nitidella</i>	Ex (NR)	1
<i>Rinodina roboris</i> var. <i>roboris</i>	Nb (IR)	1
<i>Scutula circumspecta</i>	VU (NS/S41)	1
<i>Sporodophoron cretaceum</i>	Nb (IR)	1
<i>Strigula taylorii</i>	Nb (NS/IR)	1
<i>Thelopsis rubella</i> •		1
<i>Thelotrema lepadinum</i> •		1

• = SOWI species

1 = Recorded in 2018 – 20

Wound Tack Assemblages (*Gyalectinetum carneoluteae*): well developed wound tracks are an important habitat strongly associated with the above flushed bark habitats (**Map 10**). These develop in rain tracks impacted by exudates from wounds, which produces an extreme habitat colonised by a few specialist species, some very rare, including here, one Vulnerable lichen and one Endangered moss, along with four Notable lichens and one regionally rare species.

The rare species are confined to wounds on veteran trees and the habitat was best developed on veteran Elms and has obviously declined in recent years, with the loss of old Elms. Beech, however, supports a good range of these species and Burnham Beeches is an important site for this assemblage. The habitat mainly occurs in the same sheltered areas as the flushed Beeches of high interest (**Map 10**). A total of 19 Beeches supported systematically recorded species, with one unusual occurrence of *Bellicidia incompta* (*Bacidia incompta*) on Oak. The habitat includes some quite widespread species including *Bacidina phacodes*, *Porina borrieri*, *Porina byssophila* and *Strigula taylorii*, this first two regionally rare and the generally uncommon *Scytinium subtile* (*Leptogium subtile*). Two threatened species of this habitat have important populations on the Beeches here, the lichen *Bellicidia incompta* (*Bacidia incompta*) and the moss *Zygodon forsteri*.

This is a reasonably complete assemblage for would tracks on veteran Beech but one missing species is *Scytinium fragrans* (*Collema fragrans*) EN (NR/IR/S41), which is strongly associated with the moss *Zygodon forsteri* in the New Forest.

Wound Tack Assemblages (*Gyalectinetum carneoluteae*):**Lichens**

Species	Conservation Status	2018 – 20
<i>Bacidina phacodes</i>		
<i>Bellicidia incompta</i>	VU (NS/S41)	1
<i>Porina borreri</i>	Nb (NS)	1
<i>Porina byssophila</i>	Nb (NS)	1
<i>Scytinium subtile</i>	Nb (NS)	1
<i>Strigula taylorii</i>	Nb (NS/IR)	1
Bryophytes		
<i>Zygodon forsteri</i>	EN (NR/S41)	1

1 = Recorded in 2018 – 20

Dry Lignum (*Calicietum abietinae*) & Damp Lignum (*Cladonietum coniocraeae*)

Communities: a variety of species poor communities develop on bare wood (lignum), both on live trees and dead trees. Where large pieces of dead wood or very dry bark on old trees occur, as is typical in old growth stands, uncommon specialist species can occur. The most widespread community (Damp Lignum Community) is found on damper dead wood and stumps with the lichens *Cladonia* species dominant and crust-forming *Trapeliopsis* species. This habitat is found beyond old growth stands and is visually striking but not usually of great interest, however, it can support species of interest. A more specialist habitat occurs on acid dry wood on vertical surfaces of either standing dead wood or the sides and undersides of very large fallen logs (Dry Lignum Community). Characteristic lichen species include several Pin Head lichens and fungi. Some interest was recorded on standing dead Beech and fallen Oak, but the most interesting communities were found on standing Oak dead wood. Most systematic recorded species of interest were on standing dead Oaks (27 trees) or on lignum exposed on veteran Oaks (four trees), with one standing dead Scots Pine and one live Beech also recorded. The best trees are in more exposed areas of the common and are absent from the richest area for Beech in the central valley (**Map 11**). Shading is an issue for lichen interest on a significant number of standing dead trees (nine) as these have not been systematically halo-thinned (**Map 7**).

At Burnham Beeches a total of ten species of high interest have been recorded from this habitat, including seven notable species and three regionally uncommon species. Two species were not refound 2018 – 20.

The Damp Lignum Community supported two *Cladonia* species the widespread wood woodland species *Cladonia parasitica* and the much more restricted *Cladonia incrassata*, which was new to the region. The Dry Lignum habitat supports a more diverse assemblage with *Chaenotheca brachypoda* and *Chaenotheca hispidula* on *Fagus* lignum and *Chaenotheca brunneola*, *Chaenotheca brunneola*, *Chaenothecopsis nigra*, *Lecidea nylanderii*, a rare species in England, and *Microcalicium ahlneri* on Oak lignum. In addition there is a verified record of the Notable *Chaenothecopsis pusilla* from oak lignum from 2001, which was not refound in 2020.

Compared to the other habitats this is a much more compete assemblage and the damage from past acidification has been more limited.

Dry & Damp Lignum Community (*Calicietum abietinae* & *Cladonietum coniocraeae*):

Species	Conservation Status	2018 – 20
<i>Calicium salicinum</i>		0
<i>Chaenotheca brachypoda</i> •		1
<i>Chaenotheca brunneola</i> •		1
<i>Chaenotheca hispidula</i> •	Nb (NS)	1
<i>Chaenothecopsis nigra</i>	Nb (NS)	1
<i>Chaenothecopsis pusilla</i>	Nb (NS)	0
<i>Cladonia incrassata</i>	Nb (NS)	1
<i>Cladonia parasitica</i> •		1
<i>Lecidea nylanderii</i>	Nb (NS)	1
<i>Microcalicium ahlneri</i>	Nb (NS)	1

• = SOWI species

1 = Recorded in 2018 – 20

0 = Not refound 2018 – 20

Dry Bark Assemblages on Veteran Trees (*Lecanactidetum premneae* & *Calicietum hyperelli*): this habitat occupies the dry sides of ancient Oaks and rarely other tree species. The most distinctive community, Ancient Dry Bark Community (*Lecanactidetum premneae*), is strongly associated with veteran Oaks and old growth woodland. It is internationally very rare, and otherwise known only from a few sites in France, but is widespread in southern Britain (James et al, 1977). Several characteristic species are hence International Responsibility species, and the community is of great conservation importance. This is a community of highly stressed habitats and it is not species rich but supports a high proportion of species of interest. In the New Forest evidence of chronosequences indicates that this community takes over 400 years to fully recolonise clear felled sites (Sanderson, 1996 & 2010). The Ancient Dry Bark Community is a southern oceanic community, typical of warm moist, but not too wet, areas. The lichens grow on bark only occasionally reached by stem flow and mainly absorb water from dew. On very dry bark this community grades into more general dry bark communities, including the Dry Bark Community (*Calicietum hyperelli*). This is more typical of drier, less oceanic climates but can also support some specialist species, especially pinhead lichens.

At Burnham Beeches this habitat was found in the similar areas as the lignum habitats, sometimes on the same trees (**Map 12**). Seventeen systematically recorded Oak trees supported this habitat, 16 alive and one recently dead. The Ancient Dry Bark Community was only found as a limited relic community, with the characteristic *Cresponea premneae* found as small populations on six trees and no other characteristic species surviving. The Dry Bark Community is much better developed, with several characteristic species present including a large population of *Chaenotheca stemonea*, an uncommon species in England along with *Chaenotheca*

chrysocephala, *Chaenotheca hispidula*, *Chaenotheca trichialis* and *Lecidea nylanderii*, the latter very rare in southern England.

Dry Bark Assemblages on Veteran Trees (*Lecanactidetum premneae* & *Calicietum hyperelli*):

Species	Conservation Status	2018 – 20
<i>Chaenotheca chrysocephala</i> •		1
<i>Chaenotheca hispidula</i> •	Nb (NS)	1
<i>Chaenotheca stemonea</i> •	Nb (NS)	1
<i>Chaenotheca trichialis</i> •		1
<i>Cresponea premnea</i> •	Nb (IR)	1
<i>Lecidea nylanderii</i>	Nb (NS)	1

• = SOWI species

1 = Recorded in 2018 – 20

Acid Bark Woodland Assemblages (*Parmelion laevigatae*): distinctive communities developed on well-lit but sheltered acid bark in woodlands in oceanic areas. The best known form (*Parmelietum laevigatae*) is characteristic of old growth high altitude "cloud forest" in very wet areas but less well known lowland forms occur on lower ground in wet areas and into drier but humid lowland sites (including Community Type M, the *Hypotrachyna laevigata* – *Loxospora elatina* Community of Ellis et al (2015) described from Scotland and the *Cladonia* – *Thelotrema lepadinum* Community, Sanderson, (2010) noted in south and south west England). A provisional name could be the *Loxospora elatina* – *Thelotrema lepadinum* Nodum. In old growth stands this habitat can be very rich in uncommon species and the community appears very sensitive to woodland management. Many species, which are quite mobile in areas with large areas of surviving habitat, can become rare in areas without large undisturbed refugia. In contrast to the Base Rich Bark Woodland Assemblage, this assemblage appears less able to survive on individual veteran trees.

That anything survives of this assemblage at Burnham Beeches is a surprise, it must have been near the eastern limit of the habitat and the community is vulnerable to high levels of acidifying pollution. A little does survive, but a few distinctive species were found in 2020, including the ancient woodland species *Anisomeridium ranunculosporum*, *Loxospora elatina*, *Micarea doliiformis* and *Thelotrema lepadinum* and the local *Scoliciosporum pruinosum*. The very characteristic *Schizotrema quercicola* (*Schismatomma quercicola*) was recorded in 2001 but not refound in 2020. The interest is confined to a few Oaks deep in the common (**Map 13**).

Acid Bark Woodland Assemblages (*Parmelion laevigatae*):

Species	Conservation Status	2018 – 20
<i>Anisomeridium ranunculosporum</i> •		1
<i>Loxospora elatina</i> •		1
<i>Micarea doliiformis</i>	Nb (NS)	1

<i>Schizotrema quercicola</i> •	Nb (IR)	0
<i>Scoliciosporum pruinosum</i>		1
<i>Thelotrema lepadinum</i> •		1

• = SOWI species

1 = Recorded in 2018 – 20

0 = Not refound 2018 – 20

Smooth Bark Communities (*Graphidetum scriptae*): communities on smooth bark of shrubs, especially Hazel and Holly, and smooth barked trees in sheltered woodland conditions. The basic community is composed of widespread species, especially on young vigorous trees or bushes. On ancient Hazels and Holly, and slow growing suppressed young trees, however, ancient woodland and uncommon species can occur. The community typically occurs on thin and hard smooth bark with limited capacity to survive acidification. Limited woodland interest survives in this habitat, but two new species for the site were found in 2020 *Mycoporum antecellens* on a Beech and *Stenocybe septata* on three Hollies. In 1986 the old woodland species *Pertusaria multipuncta* was recorded from Beech, potentially in this habitat.

Smooth Bark Communities (*Graphidetum scriptae*): communities

Species	Conservation Status	2018 – 20
<i>Mycoporum antecellens</i>		1
<i>Pertusaria multipuncta</i>		0
<i>Stenocybe septata</i>	Nb (IR)	1

• = SOWI species

1 = Recorded in 2018 – 20

0 = Not refound 2018 – 20

Terricolous Habitats

There was insufficient time to look at the surviving heathland to the south east and there could potentially be some lichen interest there. There was some development of a heathland lichen assemblage at Crabtree Heath, where a well-lit section of the outer moat bank supported some heathland lichens, including the very under recorded *Cladonia cryptochlorophaea* and *Lichenomphalia umbellifera* (both new to the county) and a possibly genuinely regionally uncommon species *Trapeliopsis pseudogranulosa*. Of more interest were shaded woodland assemblages on banks. The sides of the moat in Crabtree Heath was of more significant interest, with two species new to the county, which are very rare in central England: *Cladonia caespiticia* and *Trapeliopsis gelatinosa*. The former was also seen as sterile material on gravel pits banks in the south eastern valley.

3.1.3 Lichen Species of Interest

The number of locations at which systematically recorded species were recorded is given in **Table 3**. The GPS waymarks where these species were recorded are mapped on **Maps 3 & 5**. The GPS waymarks locations are shown at a large scale on **Maps 62 – 64**. The species of interest are mapped on **Maps 17 – 61**, including some Notable or

regionally rare species, which were not systematically mapped as waypoints but were mapped to eight-figure grid reference accuracy using the TomBio plugin for QGIS.

TABLE 3
Total Numbers of Lichens Recorded from Burnham Beeches NNR
2018 – 20

Species	All	VE	SWP	VD-MS	PH	CTH	EG
Lichens							
Agonimia flabelliformis	2	0	0	1	1	0	0
Anisomeridium ranunculosporum	1	0	0	0	1	0	0
Bellicidia incompta	15	0	0	6	2	5	2
Chaenotheca brunneola	1	0	1	0	0	1	0
Chaenotheca chrysocephala	3	0	1	0	0	0	2
Chaenotheca hispidula	2	0	0	1	0	1	0
Chaenotheca stemonea	11	0	3	0	1	4	3
Chaenothecopsis nigra	17	4	1	0	0	8	4
Cladonia incrassata	2	1	0	0	0	1	0
Coenogonium tavaresianum	1	0	0	0	0	1	0
Cresponea premnea	6	0	1	1	3	1	0
Lecanora jamesii	2	0	0	2	0	0	0
Lecidea nylanderii	2	0	2	0	0	0	0
Leptogium subtile	1	0	0	1	0	0	0
Loxospora elatina	4	0	2	2	0	0	0
Micarea doliiformis	1	0	0	0	0	1	0
Microcalicium ahlneri	29	5	4	0	0	8	12
Mycoporum antecellens	1	0	0	1	0	0	0
Opegrapha corticola	6	0	0	2	2	1	1
Pachyphiale carneola	2	0	0	1	1	0	0
Pertusaria pustulata	1	0	0	0	0	1	0
Porina hibernica	1	0	0	1	0	0	0
Porina multipuncta	1	0	0	0	1	0	0
Pyrenula nitida	17	0	0	14	1	2	0
Pyrenula nitidella	5	0	0	3	0	2	0
Rinodina roboris	2	0	0	1	0	1	0
Scutula circumspecta	4	0	0	4	0	0	0
Sporodophoron cretaceum	7	0	0	3	2	1	1
Stenocybe septata	3	0	0	0	0	2	1
Thelopsis rubella	6	0	0	4	1	1	0
Bryophytes							
Zygodon forsteri	10	0	0	1	3	1	5
No Trees	103	5	9	29	10	27	10

Survey Areas

- VE = Valley east of Lord Mayors Dive
 SWP = Seven Ways Plain
 VD-MS = Victoria Drive Valley & Mendelssohn's Slope
 PH = Pumpkin Hill
 CTH = Crabtree Heath
 EW = Egypt Woods

National Red Data Book Lichens Recorded from Burnham Beeches:

Bellicidia incompta (*Bacidia incompta*) (Vulnerable, NS/S41) was a widespread crust-forming species on old Elms, and occasionally other tree species, in wound tracks on bark and inside hollow trees (Wound and Rain Tracks Assemblages, *Gyalectinetum carneoluteae*). It grew on both field and wayside trees and within old growth woodlands. It is now extinct on Elm due to Dutch Elm disease destroying veteran Elms. The New Forest has been the only place it has been recorded frequently in recent decades. Here it has been found mainly on old Beech and Holly. Otherwise, it is still found on thin scatter of trees in southern England. Edwards (2006b) only recording eight sites as having two or more trees with this species; the total is now likely to be about 20 sites. It is typically found on Sycamore, Horse Chestnut or Ash outside of the New Forest. *Bellicidia incompta* was first recorded from Burnham Beeches in 2016 by Powell (2016) inside a hollow Beech (Tagged 01174, refound 2020 as tree BUB040). In 2020 it was recorded on 14 veteran Beech trees (one dead) and one Oak (**Map 20**), with most in Victoria Valley and Crabtree Heath but also two each in Pumpkin Hill and Egypt Woods. This is a major discovery and is likely to be the largest known population outside of the New Forest.

Porina hibernica (Near Threatened, NR/IR/S41) is a crust-forming lichen, which is a southern Atlantic – Mediterranean species that is found in very sheltered base rich bark on old trees (*Agonimion octosporae*). It appears to require long undisturbed conditions to build up large populations, and these are only confirmed from the New Forest, Clovelly in North Devon and Boconnoc Park in Cornwall. Beyond this it is restricted to a few trees in a scatter of sites in the south west and in north Wales. In 2020 a patch of lichen matching this lichen was recorded on the edge of a wound track on a Beech on Mendelssohn's Slope (**Map 50**). This was a very surprising record, but it is a very characteristic species of the old growth Beech woods in the New Forest.

Pertusaria pustulata (Vulnerable, NR): a crust-forming lichen of smooth hard bark on mesic bark with a sub-oceanic distribution in Europe, and mainly recorded on Beech. In Britain, a rarely recorded species, with most records from Beech and Holly in the New Forest and a few records beyond in southern England. Potentially somewhat under recorded but appears genuinely rare. There is a single old record from Burnham Beeches dated 1926 in the BLS database without any details. In 2020, it was refound on a single veteran Beech inside the moat in Crabtree Heath, a significant discovery.

Pyrenula nitida VU (NR/S41): a crust-forming lichen of smooth hard bark on intermittently flushed mesic bark with a sub-oceanic distribution in Europe. A sub-oceanic equivalent of the common oceanic *Pyrenula macrospora*, from which it can be distinguished by spore size and a K + purple reaction in the perithecia. The latter can be, with skill, used in the field. In the past *Pyrenula nitida* was much confused with *Pyrenula macrospora*, and after weeding out errors *Pyrenula nitida* proved to be rare. Confirmed records are all from veteran Beech and confined to a single record

from Kent (not seen recently), Burnham Beeches and The New Forest. At the latter it has been recorded from 12 woods, and is locally frequent in some woods. At Burnham Beeches it was long known from two Beeches at the head of Victoria Drive, one of which died a few years ago and the second died recently, prompting the start of this survey (Sanderson, 2018a). In addition to the known dead Beech *Pyrenula nitida* was found on 16 new Beech trees, one of which fell over between 2018 and 2020 (**Map 52**). The main population was on well-lit but sheltered Beeches on Mendelssohn's Slope, but this population extended at the base of Pumpkin Hill while two more trees were found in Crabtree Heath.

This represents a much larger and more sustainable population than was originally thought. It is larger than several of the New Forest populations, but does not match the largest. The populations found include ones that were expanding on to bare bark on the tree on which they were recorded and two which had every appearance of colonising on to suppressed younger Beeches near the dead previously known tree. The latter could be new colonies, while most others were clearly relic colonies. In addition to the new natural colonies material from the dead tree was transferred on to adjacent suitable trees in an experimental translocation (Sanderson, 2019).

Pyrenula nitidella Ex (NR): a crust-forming lichen of smooth hard bark on intermittently flushed mesic bark with a sub-oceanic distribution in Europe. A sub-oceanic equivalent of the common oceanic *Pyrenula chlorospila*, from which it can be distinguished by spore sized and a K + purple reaction in the perithecia. The latter can be, with skill, used in the field. In the past *Pyrenula nitidella* was much confused with *Pyrenula chlorospila*, and after weeding out errors *Pyrenula nitidella* was thought to be Extinct in Britain, with proven records only from NE Yorkshire and Perthshire. Both *Pyrenula chlorospila* and *Pyrenula nitidella* are separated from *Pyrenula macrospora* and *Pyrenula nitida* by their smaller perithecia. There is usually a separation between the taxa when well grown, but it is possible that both are just morphs of *Pyrenula macrospora* and *Pyrenula nitida* respectively. *Pyrenula nitidella* was refound in 2018 in the New Forest, where it is now known from four woods and appears much rarer than *Pyrenula nitida*. In 2019 it was subsequently also found in Burnham Beeches (Sanderson, 2019).

In 2020 it was recorded from five Beech trees, three on Mendelssohn's Slope associated with *Pyrenula nitida* and two in Crabtree Heath, where it was not associated with *Pyrenula nitida* (**Map 53**).

Scutula circumspecta (*Bacidia circumspecta*) (Vulnerable, NS/S41) (W-VU) a species of small bare flushed patches in base rich bark on veteran trees, but absent from fully developed wound track habitats, which has been found mainly on Oak, Beech, Elm and Juniper. It has always been rare is mainly confined to distinct areas, in the eastern Highlands, Northern England, eastern central Wales, Exmoor and the New Forest. Populations on Elm have all been lost, but it still survives on Oak in the west and Beech in the New Forest, where it has been recorded in 15 woods. In the south east outside of the New Forest it is very rare but has an old record from Surrey and a more recent one from Beech in Ebernoe Common, West Sussex. In 2018 it was discovered on two Beeches in Mendelssohn's Slope, a major range extension. In 2020

it was found on another two Beeches in the same area, but one of the 2018 trees had fallen (**Map 55**).

National Red Data Book Bryophytes Recorded from Burnham Beeches:

Zygodon forsteri (Endangered, NR/S41): this rare bryophyte shares the wound track habitat of several rare lichens, so was recorded at the same time as the lichens. It is very rare in Britain and is also rare in Europe. Other than very old historic records, it has only been recorded from three areas on veteran Beech in England: Epping Forest, Burnham Beeches and the New Forest. In the author's experience it is thriving in the New Forest, with new trees regularly encountered during lichen surveys (Sanderson, 2019) but on a recent visit appeared threatened by increasing shade in Epping Forest. During the 2020 survey it was recorded on 10 veteran Beeches, five in Egypt Woods, three on Pumpkin Hill and one each in Mendelssohn's Slope and Crabtree Heath (**Map 61**). This moss appears to prefer the more open woods up slope than the more shelter trees in Mendelssohn's Slope, which the wound track *Bellicidia incompta* (*Bacidia incompta*) (**Map 20**) appears to prefer. Ten trees is a very good population for this species and was a very positive result for the survey.

Notable Species in Draft England Red List or Assessed Species

Chaenotheca stemonea (Notable, NS) an uncommon pinhead lichen confined to dry bark on ancient trees, which is thinly scattered throughout Britain except the far west. Assessed as Near Threatened in England in the draft England Red List. Recorded new to Burnham Beeches by Powell (2016) on a veteran Oak (Tagged 01425). During this survey and recorded on dry bark on 10 veteran Oaks, one a standing dead tree with some bark still attached. Scattered through the higher ground (**Map 26**).

Coenogonium tavaresianum (*Dimerella tavaresiana*) (Notable, NR) a recent discovery for Britain, found on old Oaks in parkland in base rich flushes on the bark in Hampshire and Oxfordshire in 2017. Recently also found on Oaks in Moccas Park, Herefordshire, further sites in the New Forest and in Dartmoor. *C. tavaresianum* is internationally rare and had previously been known only from undisturbed humid Mediterranean woodland habitats in southern Europe (Southern France, Portugal, Spain and Italy) and the Canary Islands. It is regarded as threatened or red listed in all these counties (Critically Endangered in France, Vulnerable in Italy and Data Deficient in Iberia). Its recent discovery in Britain was a surprise but is apparently a species with a southern Atlantic – Mediterranean distribution. It is likely to be rare and threatened in Britain but had probably been overlooked as the common *Gyalecta truncigena*. In 2019 it was found on a veteran Oak in Crabtree Heath by Dave Lamarcraft and was refound on the same oak in 2020 (**Map 32**; a major discovery).

Microcalicium ahlneri (Notable, NS) is a pinhead fungus species found in the Dry Lignum Community (*Calicietum abietini*) on dry vertical lignum on live or standing dead Oaks, or in Scotland, Pines, where it probably parasitises algae. It is a widespread Nationally Scarce species, which is probably under recorded, but clearly confined to old growth stands and veteran trees, in both broadleaved woodlands and native Pinewoods. It is widespread in the New Forest but is otherwise rare in southern

England and is assessed as Near Threatened in England in the draft England Red List. Known to be present on standing dead Oaks in Burnham Beeches since the 1990s by the author. In 2020, found to be widespread on standing dead Oaks, lignum on live Oak and once on Oak bark and lignum on a standing dead Oak and recorded at 29 locations (**Map 41**). The species is absent from Mendelssohn's Slope and Pumpkin Hill, where dead Oaks are rare, but widespread elsewhere. The fungus is shade tolerant so has survived on the many deeply shaded standing dead Oaks (**Map 7**). This is a very large population for England, potentially the largest single population.

Other Notable Species

Agonimia flabelliformis (Notable, NR) a recent segregate from *Agonimia allobata* Nb (NS), which is a crust-forming lichen. *Agonimia flabelliformis* is a minute shrubby lichen typical of sheltered base rich bark in humid conditions. It appears to be a more southern species than *Agonimia allobata* but can be equally frequent. Both species occur in old growth woodlands, and occasionally on old trees in neglected coppices. Recorded new to the county in 2018 and finally recorded from base rich bark on an Oak and a Beech in the central valley (**Map 17**).

Bacidia friesiana (Notable, NS) is a crust-forming species of mildly nutrient enriched and base rich bark including old Elder trees. It is little recorded and apparently quite rare. Recorded by William Purvis in the 1970s or 1980s. Not seen since. (More detail would be useful for this record, *Bacidia friesiana* recorded from veteran Beech in the New Forest is being investigated as actually being the rare southern oceanic *Bacidia endoleuroides*).

Chaenotheca hispidula (Notable, NS) a widespread but scattered pinhead lichen of lignum or dry bark on less acid species especially Beech and Ash lignum and occasionally Oak bark. Usually found in old growth stands. Recorded by Powell (2016) from inside a hollow old Beech (Tagged 01221). Refound on this tree in 2020 (tree BUB035) but also on an Oak on bark in Crabtree Heath (**Map 25**).

Chaenothecopsis nigra (Notable, NS) is a pinhead fungus found in the Dry Lignum Community (*Calicium abietinum*) on dry vertical or overhanging lignum on standing dead Oaks or large fallen Oaks. It is a widespread Nationally Scarce species, which is probably under recorded, but clearly confined to old growth stands. First recorded by Powell (2016) on lignum on a veteran tree (Tagged 01462). During the 2019 – 20 survey recorded on 17 trees, 15 of these being standing dead Oak and the other three live trees. The species is absent from Mendelssohn's Slope and Pumpkin Hill, where dead Oaks are rare, but widespread elsewhere (**Map 28**). The fungus is shade tolerant so has survived on the many deeply shaded standing dead Oaks (**Map 7**).

Chaenothecopsis pusilla (Notable, NS) is a pinhead fungus found in the Dry Lignum Community (*Calicium abietinum*) on dry vertical or overhanging lignum on standing dead Oaks or large fallen Oaks. Recorded from the Scottish Highlands and southern England, it is probably under recorded, but largely confined to old growth stands. Recorded by S. Davey in 2001 and confirmed by B J Coppins. Not refound in 2020.

Cladonia incrassata (Notable, NS) is a small shrubby lichen found damp shaded rocks, peat banks and damp dead wood in scattered locations across the west and south, but very rare in the east of England. In 2020, found new to the county on the bases of two standing dead Oaks (**Map 30**).

Cresponea premnea (Notable, IR) is a widespread crust-forming lichen in southern Britain that defines the Ancient Dry Bark Community (*Lecanactidetum premneae*); it is an SOWI Ancient Woodland Indicator species. It is very rare in the rest of Europe and is hence an International Responsibility species. Recorded from Burnham Beeches by Francis Rose before 1971. Refound during the current survey on six Oaks, usually as small populations, with three trees on Pumpkin Hill with one each in Seven Ways Plain, high up on Mendelssohn's Slope and Crabtree Heath (**Map 34**).

Lecidea nylanderii Nb (NS) a crust-forming sorediate lichen, sterile in Britain. A northern species in Britain, mainly found on dead wood and acid bark in eastern Scotland. Until recently unknown from England or Wales, but recently detected as a rare species of sites with large dead wood resources in eastern and southern England. First recorded from Burnham Beeches by M. Powell, as the third English record (but not identified until after the report by Powell (2016)) on the bark of a veteran Oak. In 2020, refound on Oak lignum and bark on two trees in Seven Ways Plain (**Map 37**).

Micarea doliiformis (Notable, NS) is a crust-forming species found on acid bark and lignum on old trees in the south west. Its original habitat appears to have been on ancient Oaks, especially the lignum inside hollow trees, but it has spread to old conifers locally and may have benefited from mild acidification. Recorded new to the county in 2020 on an acid Oak on the driftway below Crabtree Heath. (**Map 17**).

Opegrapha corticola (Notable, IR) is a southern oceanic lichen of base rich flushed bark on ancient trees, which used in the SOWI index. It is characteristic of veteran trees in sheltered, and often quite shaded woodlands, in the south west of England and Wales. Recorded new to the county in the 2018 – 20 survey, a significant range extension, when it was found to be scattered in sheltered areas on five veteran Beech and an Oak (**Map 44**).

Porina borreii (Notable, NS) is a crust-forming lichen, which is widespread in rain tracks on old trees in woods or parks in the south and west, but very rare in eastern England. First recorded from the county on a Beech in the eastern valley by Powell (2016). The 2018 – 20 survey refound it as rare in the eastern valley but was frequent in the central valley and rare in Crabtree Heath (**Map 49**) on veteran Beech, rarely colonising younger Beeches in the middle of the central valley.

Porina byssophila (Notable, NR) a crust-forming lichen, until recently thought to be a rare specialist of shaded limestone outcrops. Now know also to occur in wound tracks on trees. It appears to be widespread but local in this newly discovered habitat, and occurs in disturbed as well as old growth woodland. First recorded by Powell (2016) on a Beech in the middle of the central valley. In the 2018 – 20 survey found it to be locally abundant in more sheltered areas, mainly on Beech but also on Hazel and Oak, widely colonising younger Beech.

Rinodina roboris var. *roboris* (Notable, IR) is a crust-forming lichen, which is a specialist species of mesic to base enriched bark on quite well-lit old veteran trees, mainly Oak, which is widespread in open woodland, parks and wayside trees in southern England. It is a western European endemic that is rare outside of Britain, hence the International Responsibility status. It is still widespread and locally plentiful in clean air areas with frequent old trees, lost from parts of eastern and central England from air pollution. Found new to Burnham Beeches during the 2018 – 20 survey on two veteran Beeches, one on Mendelssohn's Slope and on inside the moat in Crabtree Heath (**Map 54**).

Schizotrema quercicola (*Schismatomma quercicola*) (Notable, IR) is a sterile crust-forming species, known only from Britain and Norway, which is used in both the SOWI and the URI indices. It is a southern and western species of acid bark in woodlands, which is commoner in the New Forest than anywhere else, in the rest of Britain it is much more uncommon and more of a relic species and very rare in east and central England. Recorded by S. Davey in 2001 but not refound in the current survey.

Sporodophoron cretaceum (*Schismatomma cretaceum*) (Notable, IR) is a crust-forming lichen, which is widespread along the south coast but is scarcer to the north. It is confined to dry bark on old trees especially in Ancient Dry Bark Community (*Lecanactidetum premnae*) and into intermittently flushed bark on the edge of damper bark. Found new to the county during the current survey on the edges of flushed bark on six veteran Beeches, two dead, and one Oak, mainly in the central valley but with one Beech each in Crabtree Heath and Egypt Woods (**Map 56**).

Stenocybe septata (Notable, IR) a southern and western a Pin Head fungus confined to the bark of old Hollies (Smooth Bark Community *Graphidetum scriptae*), mainly western and southern and rare in central and eastern England. Recorded new to the county on three Hollies, two in Crabtree Heath and one in Egypt Woods (**Map 57**).

Scytinium subtile (*Leptogium subtile*) (Notable, NS) is a small crust like shrubby lichen. It is possibly a rather ephemeral and under recorded species of bark and debris on base rich old trees. In 2020 found in a wound track on a Beech on Mendelssohn's Slope with *Zygodon forsteri* EN (NR/S41) growing adjacent to, and partly overgrown by, *Porina hibernica* NT (NR/IR/S41) (**Map 38**). A significant range extension.

Strigula taylorii (Notable, NS) is a mainly south-western, crust-forming lichen confined to rain and wound tracks on base rich bark on sheltered, mainly woodland trees, occurring in younger woodlands as well as old growth woods. It can easily be overlooked as the common *Porina aenea* unless the surveyor has got an eye in for this species. It is clearly under recorded but is of conservation interest. Recorded new to the site the 2018 – 20 survey found it to be locally frequent in more sheltered areas, mainly on Beech but also on Hazel, locally colonising younger Beech.

Other Systematically Mapped Species of Interest

Anisomeridium ranunculosporum: a widespread western crust-forming Ancient Woodland Indicator lichen used in the SOWI index. Grows in several communities on acid to mesic bark on mature and veteran trees in woodland. It can readily colonise mature young growth stands and is often abundant in old growth pasture woodlands. Previously unknown from central and eastern England, but found, new to the county, on a single very rich Oak at the base of Pumpkin Hill (**Map 18**).

Chaenotheca brunneola is a widespread pinhead lichen and SOWI Ancient Woodland Indicator, which is characteristic of Dry Lignum Communities (*Calicietum abietini*) on ancient trees, especially on Pine and Oak. Found by the current survey, new to the county on lignum on a standing dead Oak and lignum on a live veteran in in Crabtree Heath and Seven Ways Plain (**Map 23**).

Chaenotheca chrysocephala is a widespread eastern and northern pinhead lichen and SOWI Ancient Woodland Indicator, which is characteristic of Dry Bark Communities (*Calicium hyperelli*) on ancient trees, especially on Pine and Oak. Recorded, apparently new to the site on three Oaks in Seven Ways Plain and Egypt Wood (**Map 24**).

Lecanora jamesii a widespread southern and western crust-forming lichen of sheltered humid woodland, especially Beech and Sallow, used in the SOWI index. Recorded, second record for the county, on two veteran Beech on Mendelssohn's Slope (**Map 36**)

Loxospora elatina is a widespread old woodland lichen used in the SOWI index and characteristic of acid bark and lignum. Northern and western, very rare in east and central England. Originally recorded from Oak in Burnham Beeches by Francis Rose before 1971. Refound during the current survey on three Oaks, one a younger tree, and a Beech on Mendelssohn's Slope and Seven Ways Plain (**Map 39**)

Mycoporum antecellens a lichen of smooth mesic bark, especially Holly, Rowan and Beech in oceanic woodlands, used in the SOWI index. Recorded, new to the county on a single Beech in the central valley, by Burnham Walk (**Map 42**). A major range extension.

Pachyphiale carneola is a widespread southern and western crust-forming SOWI Ancient Woodland Indicator lichen. It grows in shaded transitions between the Mature Mesic Bark Community (*Pertusarietum amarae*) to the Base Rich Bark Woodland Community (*Agonimion octosporae*). Recorded, new to the site, during the 2018 – 20 survey on a single Oak and on a Beech at Pumpkin Hill and Mendelssohn's Slope (**Map 46**)

Porina multipuncta (*Opegrapha multipuncta*) a normally sterile crust-forming sorediate species of damp habitats, mainly on veteran trees in the south more generally on bark and rock in the north. Recorded, new to the county on a single species rich Oak at the base of Pumpkin Hill, during the current survey (**Map 51**).

Thelopsis rubella is a widespread crust-forming species of the Base Rich Bark Community (*Agonimion octosporae*) in old growth stands in the south and west of

Britain. In 2018 – 20, recorded new to the region on six veteran Beech trees, one of which was dead. Four on Mendelssohn's Slope and one each in Pumpkin Hill and Crabtree Heath (**Map 59**). A major range extension and a very significant find.

Other Species of Interest

Some other species of interest which were not mapped systematically with waypoints, have been mapped using the TomBio plugin, mostly to a 10m grid.

A group of species which are common to the west of Britain, but are regionally rare are occasional to widespread on flushed less acid bark on the veteran Beeches in sheltered locations at Burnham Beeches. Mapped species are *Bacidina phacodes* (*Bacidia phacodes*) (**Map 19**), *Coniocarpon cinnabarinum* (*Arthonia cinnabarina*) (**Map 33**), *Enterographa crassa* (**Map 35**) and *Normandina acroglypta* (**Map 43**). Some of these are beginning to colonise from the oldest trees, especially in the central valley by Burnham Walk. The generalist old woodland species *Thelotrema lepadinum* (**Map 59**) grows on both Oak and Beech and is also very locally beginning to colonise younger trees, especially in the central valley by Burnham Walk. Also mapped is *Pachnolepia pruinata* (*Arthonia pruinata*) (**Map 45**), a local species of drier bark, was noted on two Beeches in Crabtree Heath on the drier edges of flushed bark habitats.

A specialist of the Mature Mesic Bark Community (*Pertusarietum amarae*) on veteran well-lit Oaks *Pertusaria flavida* (**Map 47**), was recorded on two veteran Oaks.

Other dead wood species of interest characteristic of Oak lignum include the old woodland *Cladonia parasitica* (**Map 31**) and the more widespread *Calicium glaucellum* (**Map 21**). Both were rather rarer than expected but can be expected to increase in the future. The more local *Chaenotheca brachypoda* (**Map 22**) was also recorded twice on Beech lignum in the central valley

The most widespread characteristic species of dry bark on veteran Oaks recorded was *Chaenotheca trichialis* (**Map 27**). This was too widespread to map with waypoints, but was recorded to a 10m grid.

Finally the two regionally rare woodland terricolous species *Cladonia caespiticia* (**Map 29**) and *Trapeliopsis gelatinosa* (**Map 60**) were also mapped.

3.2 Description of Survey Areas

3.2.1 Introduction

The lichen species of interest, the communities and structure of the areas (**Map 2**) are described below. Individual locations of interest are shown on **Maps 3 & 62 – 64**.

3.2.2 Valley east of Lord Mayors Dive

The valley with ponds and adjacent plateau east of Lord Mayors Dive, consisting of pasture woodland on common land, but graded to heath to the east, now recent woodland. Most of the area is within the oldest area of revived grazing behind a fence, but with limited impact visible. With fewer very old trees than the other areas of pasture woodland. There are limited lichen assemblages on those veteran trees that do occur, which are set in dense developing high forest and are heavily shaded. Scattered old Oak have been killed by being over topped by younger trees, so there is a significant resource of standing dead Oak lignum and it is this that supports the most significant lichen interest here.

Lichens: the least interesting area of pasture woodland for lichens but with some significant interest associated with standing dead Oaks

Biodiversity Measures	ELMD
Total taxa	82
Southern Oceanic Woodland Index	2
Pinhead Lichen Index score	4
Extinct (recently re-found)	0
Vulnerable	0
Near Threatened	0
Notable	5
International Responsibility Species	0
Section 41 species	0
TNTN score	5

The standing dead wood supports good populations of *Chaenothecopsis nigra* Nb (NS) and *Microcalicium ahlneri* Nb (NS) along with the regionally rare *Cladonia incrassata* Nb (NS), which was new to the county, on one better lit tree. The latter was on a tree that was still partly alive that had been halo thinned and was better lit. Most other standing dead Oaks were rather shaded (**Map 7**). Otherwise the limited epiphytic interest included *Chaenotheca trichialis* on dry bark of veteran Oak and *Porina borneri* Nb (NS) on Beech along with the more widespread local Beech specialists *Enterographa crassa* and *Porina byssophila* Nb (NS).

Observations: the standing dead trees should also be halo thinned to let in more light and encourage a more diverse dead wood assemblage. In the long term the dense regrowing high forest needs irregular thinning and grazing to allow it to develop into new area of old growth pasture woodland.

3.2.3 Seven Ways Plain

The plateau between the two main valleys, with pasture woodland, which is within the oldest area of revived grazing behind a fence. The most open area of pasture woodland with many well-lit veteran trees, with frequent old Oak and Beech, but there are also some patches with denser young trees. There is a significant lignum and dry bark assemblage on a scatter of veteran Oak and some acid bark lichen interest. The exposed Beech trees in contrast are very species poor.

Lichens: this area has the richest pinhead lichen of any of the areas surveyed on the old Oaks, but the general old woodland assemblage is poorer than the more sheltered areas.

Biodiversity Measures	SWP
Southern Oceanic Woodland Index	7
Pinhead Lichen Index score	8
Extinct (recently re-found)	0
Vulnerable	0
Near Threatened	0
Notable	5
International Responsibility Species	0
Section 41 species	0
TNTN score	5

The lignum and dry bark lichen assemblage includes *Calicium glaucellum*, *Chaenotheca brunneola*, *Chaenothecopsis nigra* Nb (NS), *Lecidea nylanderii* Nb (NS) and *Microcalicium ahneri* Nb (NS) on lignum. Species on bark include *Chaenotheca chrysocephala*, *Chaenotheca stemonea* Nb (NS), *Chaenotheca trichialis*, *Cresponea premnea* Nb (IR) and *Lecidea nylanderii* Nb (NS). Additional interest includes *Loxospora elatina* and *Thelotrema lepadinum* on acid bark on veteran Oaks. The limited Beech assemblage includes *Enterographa crassa*.

Observations: this area is in good condition but has been badly impacted by past acidifying pollution. In time it should recover from this.

3.2.4 Victoria Drive & Mendelssohn's Slope

The central valley, downstream of the junction with The Nile. Outside the fenced area but with some grazing constrained by a buried cable, although this has had limited visual impact. Pasture woodland dominated by veteran Beech in a sheltered valley with Beech, Oak and Holly infill. Most of the richer old trees are in manually maintained glades that have prevented excessive shading from the infill. Some of the sheltered well-lit veteran Beech are the richest and most important trees on the common, but there are also many species poor trees damaged by past pollution and more recent shade.

Lichens: this is the richest area for lichens within Burnham Beeches with very well developed Flushed Base Rich Bark and Wound Tack Assemblages but more limited Dry Lignum Community, Dry Bark Assemblages, Acid Bark Woodland Assemblages and Smooth Bark Communities.

Biodiversity Measures	VVMS
Total taxa	72
Southern Oceanic Woodland Index	12
Pinhead Lichen Index score	3
Extinct (recently re-found)	1
Vulnerable	3
Near Threatened	1
Notable	9
International Responsibility Species	5
Section 41 species	4
TNTN score	25

The Flushed Base Rich Bark habitat on Beech proved to support a far richer assemblage of lichens than was expected. Rare species include a large population of *Pyrenula nitida* VU (NR/S41), which had thought to be on far fewer trees, *Pyrenula nitidella* Ex (NR), until recently thought extinct in Britain, *Porina hibernica* NT (NS/IR/S41) and *Scutula circumspecta* (*Bacidia circumspecta*) VU (NS/S41), the latter three new to the site. Other species of national interest in this habitat include *Agonimia flabelliformis* Nb (NR), *Opegrapha corticola* Nb (IR), *Pachyphiale carneola*, *Porina borneri* Nb (NS), *Rinodina roboris* var. *roboris* Nb (IR), *Sporodophoron cretaceum* Nb (IR) and *Thelopsis rubella*, all new to the since 2016. Species of more local interest include *Bacidina phacodes*, *Coniocarpon cinnabarinum*, *Enterographa crassa*, *Lecanora jamesii*, *Normandina acroglypta*, *Porina byssophila* Nb (NS), *Pyrenula chlorospila* and *Strigula taylorii* Nb (NS/IR). Also important are the specialists assemblages in well-developed wound track on the old Beeches, with a significant population of *Bellicidia incompta* (*Bacidia incompta*) VU (NS/S41), while the moss *Zygodon forsteri* EN (NR/S41) was found on one tree. Also confined to this habitat was *Scytinium subtile* (*Leptogium subtile*) Nb (NS) new to the county.

Other habitats were less well developed, but included *Mycoporum antecellens* and *Thelotrema lepadinum* on mesic bark, while dry bark on veteran Oaks supported *Chaenotheca trichialis* and *Cresponea premnea* Nb (IR), with *Loxospora elatina* on acid Oaks. Lignum habitats were poorly developed due to fewer old Oaks but the Beech lignum specialists *Chaenotheca brachypoda* and *Chaenotheca hispidula* Nb (NS) were recorded.

Limited colonization of younger trees, even older post mature trees was seen, but it was occurring in the upper section of the valley by Burnham Walk, with even *Pyrenula nitida* VU (NR/S41), observed colonising suppressed slow growing younger Beeches. This area has less Holly and is a bit better lit but is still rather too dark. The current management of only halo thinning around existing veteran trees is leaving the successor trees in the shade.

Observations: the halo thinning around the old trees is vital to maintain the interest here and absolutely needs to continue. In the long term increased grazing pressure and thinning of dense young stands to promote a more gladed structure to produce a more sustainable pasture woodland structure that will promote colonisation from

the oldest trees is required. Continuing death of veteran Beech was observed over the three years of the survey on Mendelssohn's Slope.

3.2.5 Pumpkin Hill

The area of lichen interest on Pumpkin Hill, is an extension of the Victoria Drive and Mendelssohn's Slope area, but on the other side of the valley, and beyond the quarried area at Juniper Grove. The lower slope form a narrow strip of pasture woodland between the common edge to the west and the former coppice of New Coppice. This area has a scatter of veteran Oak and groves of veteran Beech pollards of high lichen interest. Higher up the slope the woodland is mostly dominated by younger Oak, with rare veteran trees, so lichen the lichen interest much reduced. The Beeches are similar in interest to those on Mendelssohn's Slope, but there are more Oaks of interest, increasing the range of lichen rich habitats. All the lichen rich trees were in maintained glades, the area is outside of the fenced grazing. It was not clear if the area was within the grazing area defined by buried cables.

Lichens: there is only a small lichen-rich area but this supports a good assemblage of old woodland lichens, with well-developed Flushed Base Rich Bark and Wound Tack Assemblages and better Dry Bark Assemblages than Mendelssohn's Slope. One Oak at the base of slope is particularly spectacular for lichens and was the richest Oak found in Burnham Beeches.

Biodiversity Measure	PH
Total taxa	40
Southern Oceanic Woodland Index	8
Pinhead Lichen Index score	3
Extinct (recently re-found)	0
Vulnerable	2
Near Threatened	0
Notable	6
International Responsibility Species	2
Section 41 species	2
TNTN score	14

The Flushed Base Rich Bark habitat on Beech includes *Pyrenula nitida* VU (NR/S41), on a single tree, along with other trees with *Opegrapha corticola* Nb (IR), *Porina borrieri* Nb (NS), *Thelopsis rubella*, *Porina byssophila* Nb (NS), *Enterographa crassa* and *Coniocarpon cinnabarinum*. The most spectacular development of the community, however, is on a big old Oak at the base of slope (BUB005), which supported *Agonimia flabelliformis* Nb (NR), *Bacidina phacodes*, *Enterographa crassa*, *Opegrapha corticola* Nb (IR), *Pachyphiale carneola*, *Pertusaria flavida*, *Porina multipuncta* and *Sporodophoron cretaceum* Nb (IR). Also on this tree was the acid to mesic bark old woodland lichen *Anisomeridium ranunculosporum*, new to the county. Near this tree a post mature Oak on gravel pit bank had a rare instance of colonisation by *Enterographa crassa* on to a younger veteran Oak. The Beeches also support well developed wound track habitats, with *Bellicidia incompta* (*Bacidia incompta*) VU (NS/S41) on two Beeches and the very rare moss *Zygodon forsteri* EN

(NR/S41) on three trees, the second largest population at Burnham Beeches found in 2020.

Dry bark habitats on veteran Oaks are significant, with a strong population of *Cresponea premnea* Nb (IR) on one tree, along with *Chaenotheca trichialis* lower on the hill. There was also *Chaenotheca stemonea* Nb (NS) on a veteran Oak further north. Lignum habitats are more limited but *Chaenotheca brachypoda* was recorded on a standing dead younger Beech.

Observations: the halo thinning around the old trees is vital to maintain the interest here and absolutely needs to continue. In the long term increased grazing pressure and thinning of dense young stand to promote a more gladed structure to produce a more sustainable pasture woodland structure that will promote colonisation from the oldest trees is required.

3.2.6 Crabtree Heath

An area of common land with ancient pasture woodland north of Tower Wood and east of Fleet Wood, connected to the pasture woodland to the south by a driftway between the two woods. The driftway also supports pasture woodland. The area has groves of old Beech, but also frequent veteran Oak, along with open areas or only young trees. The area has been well thinned with a good structure and is within the area grazed by animals contained by buried cables, but the impact of grazing is not very evident. Patchy lichen interest, with areas of lichen interest on both Beech and Oak but also extensive area with only species poor acidified veteran trees present.

Lichens: the lichen interest is concentrated in two areas, the largest to the south of the main area and the second inside the moated area, as well as scattered trees of interest beyond, especially to the south and into the driftway. The area is the second richest area on the common, and richer than Mendelssohn's Slope for some features such as dry bark and deadwood habitats and Notable species. The areas supports good Flushed Base Rich Bark and Wound Tack Assemblages along with well-developed Dry Bark Assemblages and Lignum Assemblages along with some additional interest on smooth bark on Holly, acid bark on old Oak and shaded acid soil.

Biodiversity Measure	CTH
Total taxa	28
Southern Oceanic Woodland Index	10
Pinhead Lichen Index score	7
Extinct (recently re-found)	1
Vulnerable	3
Near Threatened	0
Notable	14
International Responsibility Species	5
Section 41 species	2
TNTN score	30

The old Beeches and one Oak support Flushed Base Rich Bark Assemblages along with associated Wound Track Assemblage. The former habitat includes four Beeches with either *Pyrenula nitida* VU (NR/S41) or *Pyrenula nitidella* Ex (NR), adding to the nationally important populations of these species. A well-lit Beech inside the moat was also found to support *Pertusaria pustulata* VU (NR), last recorded in 1926 from here. The Oak supported *Coenogonium tavaresianum* Nb (NR), a rare newly discovered species to Britain. Other species of interest in this habitat include species of nationally interest including *Opegrapha corticola* Nb (IR), *Porina borneri* Nb (NS), *Rinodina roboris* var. *roboris* Nb (IR), *Sporodophoron cretaceum* Nb (IR) and *Thelopsis rubella*. Species of more local interest include *Bacidina phacodes*, *Coniocarpon cinnabarinum*, *Enterographa crassa*, *Pachnolepia pruinata*, *Pertusaria flavida*, *Porina byssophila* Nb (NS), *Pyrenula chlorospila* and *Strigula taylorii* Nb (NS/IR). *Thelotrema lepadinum* a species of several habitats mainly survives in dry areas of flushed bark. Associated wood track species includes a strong population of *Bellicidia incompta* (*Bacidia incompta*) VU (NS/S41) on four Beech and one Oak, along with the very rare moss *Zygodon forsteri* EN (NR/S41) on one Beech.

Lignum habitats include *Cladonia incrassata* Nb (NS) on damp wood on the base of the moat ditch and frequent dry lignum on standing dead wood with *Chaenotheca brunneola*, *Chaenothecopsis nigra* Nb (NS) and *Microcalicium ahlneri* Nb (NS). Surviving dry bark on Oak is less widespread but adds *Chaenotheca hispidula* Nb (NS), *Chaenotheca stemonea* Nb (NS), *Chaenotheca trichialis* and *Cresponea premnea* Nb (IR). The typical lignum species *Chaenothecopsis nigra* Nb (NS) and *Microcalicium ahlneri* Nb (NS) were also recorded once on dry bark of an old Oak as well.

Other minor habitats include smooth bark habitats on Holly, which rarely supports *Stenocybe septata* Nb (IR), new to the site. Shaded acid soils on the moat also supports two regionally rare mainly western or northern species: *Cladonia caespiticia* and *Trapeliopsis gelatinosa*.

Observations: the structure here is very good, with no shaded trees of interest recorded in 2020, presumably due to past thinning. As yet the grazing appears to be having rather limited impact, with time, increasing the grazing pressure would help maintain the well-developed pasture woodland structure here.

3.2.7 Egypt Woods

The block of pasture woodland to the north east from The Nile valley north up on to the plateau above. The interesting woodland is separated from the Victoria Drive & Mendelssohn's Slope area of high interest by a lichen poor area of dense high forest with no ancient trees and only rare post mature Oak and Beech. The valley of The Nile has some more sheltered veteran Beeches, similar to those downstream, but most of the wood is more exposed than other areas and has many acidified trees. The pasture woodland includes some area with dense infill between veteran trees, especially to the south, but also more open groves of veteran Beech and Oak more frequent to the north. Most of the area is grazed by animals contained by buried cables, but the impact of grazing is not very evident. There are some over shaded

trees of interest, mainly standing dead Oaks but also one live Beech tree with *Zygodon forsteri* (NR/S41) (BUB100). The proportion of species poor trees was high compared to Crabtree Heath and especially Mendelssohn's Slope with more high pH habitats confined to more sheltered areas.

Lichens: the wood is noticeably more acidified than Crabtree Heath and the numbers of species of conservation interest are not high, but the lichen assemblage includes some significant populations of rare species. The Lignum Bark Assemblages and Dry Assemblages are well developed, with significant Wound Track Assemblages. In addition, there are some developments of the Flushed Base Rich Bark and Smooth Bark habitats.

Biodiversity Measure	EW
Total taxa	18
Southern Oceanic Woodland Index	7
Pinhead Lichen Index score	5
Extinct (recently re-found)	0
Vulnerable	1
Near Threatened	0
Notable	8
International Responsibility Species	4
Section 41 species	1
TNTN score	12

The most widespread habitat of interest is dry lignum on stand dead Oaks, which are frequent. These trees support *Chaenothecopsis nigra* Nb (NS) and a particularly large *Microcalicium ahlneri* Nb (NS) population with eight locations recorded. The latter was recorded mainly on Oak, but one colony was on a standing dead Scots Pine on the southern edge of the old woodland. Fallen lignum supports *Cladonia parasitica* at one site in damp lignum habitat. Dry bark habitat on ancient Oak pollards, includes three oaks with *Chaenotheca stemonea* Nb (NS) and two with *Chaenotheca chrysocephala* along with *Chaenotheca trichialis*. The typical lignum species *Chaenothecopsis nigra* Nb (NS) was also recorded once on dry bark of an old Oak as well.

The wound track habitat is important for the largest population of the very rare moss *Zygodon forsteri* EN (NR/S41) recorded in Burnham Beeches in 2020. The moss recorded on five Beeches, a major population in its own right. In addition, *Bellicidia incompta* (*Bacidia incompta*) VU (NS/S41) was recorded on two Beeches. The flushed bark habitat is rare and confined to the most sheltered Beeches with species of interest recorded including *Opegrapha corticola* Nb (IR) and *Sporodoporon cretaceum* Nb (IR). Slightly more widespread are *Enterographa crassa*, *Porina byssophila* Nb (NS), *Pyrenula chlorospila*, *Strigula taylorii* Nb (NS/IR) and *Thelotrema lepadinum*.

A minor habitat was smooth bark habitats on Holly, which rarely supports *Stenocybe septata* Nb (IR), new to the site.

Observations: the halo thinning around the old trees is vital to maintain the interest here and absolutely needs to continue. In the long term, increased grazing pressure and thinning of the remaining dense young stands to promote a more gladed structure to produce a more sustainable pasture woodland structure that will promote colonisation from the oldest trees is required.

3.2.8 New Coppice & Fleet Wood

Transects were made through the former coppices of New Coppice and Fleet Wood, along with loops into these woods when surveying the adjacent old growth pasture woodland. Parts of these former coppices have now developed into high forests with locally frequent post mature Oak and Beech. In clean air areas, such adjacent developing stands of about 19th age would already be well colonised by more mobile old woodland lichen specialists, such as *Thelotrema lepadinum*. In this case, only a single instance of a species of conservation interest crossing the border with pasture woodland, where *Thelotrema lepadinum* had colonised an Oak in Fleet Wood, close to Crabtree Heath. There is active colonisation of younger trees close to the boundary with the coppices, as south of Burnham Walk by Fleet Wood, but as yet this has not occurred inside the former coppice here.

Observations: there is great potential within New Coppice and Fleet Wood, for developing new old growth pasture woodlands. This will need increased grazing pressure and some thinning to create more glades and to reduce shade. Holly shrub layers in particular will need thinning by coppicing and or pollarding locally.

4.0 NATURE CONSERVATION VALUE AND MANAGEMENT

4.1 Nature Conservation Value

4.1.1 Value of Lichen Assemblage

Burnham Beeches NNR scores 21 using the SOWI (Southern Oceanic Woodland Index) for all data, 20 for post 2000 data and 19 for the 2018 – 2020 survey. The threshold for SSSI quality for this index in this area is 20 (Sanderson et al, 2018). The score is just at the threshold but is easily the richest score in the Natural England Area of Search (115 Thames Valley). The Pinhead Index score for all data is 13 for all data, 11 for post 2000 data and 10 for the 2018 – 20 survey, with the threshold for SSSI quality 10 (Sanderson et al, 2018). As well as the high scores produced by these indices, the area also supports many species of conservation interest in their own right. These are listed below (• = Section 41 species. In the Survey column; 1 = Seen 2018 – 20, 0 = last recorded 2001 & + = Not seen after 1999):

One Extinct RDB species (recently refound):

Species	Status	Survey
<i>Pyrenula nitidella</i>	NR	1
Total number Ex species 2018 – 20		1

Four Vulnerable RDB species:

Species	Status	Survey	Synonym
<i>Bellicidia incompta</i> •	NS	1	<i>Bacidia incompta</i>
<i>Pertusaria pustulata</i>	NR	1	
<i>Pyrenula nitida</i> •	NR	1	
<i>Scutula circumspecta</i> •	NS	1	<i>Bacidia circumspecta</i>
Total number VU species 2018 – 20		4	

One Near Threatened RDB species:

Species	Status	Survey	Synonym
<i>Porina hibernica</i> •	NS/IR	1	
Total number NT species 2018 – 20		1	

20 Notable species:

Species	Status	Survey	Synonym
<i>Agonimia flabelliformis</i>	Nb (NR)	1	
<i>Bacidia friesiana</i>	Nb (NS)	+	
<i>Chaenotheca hispidula</i>	Nb (NS)	1	
<i>Chaenotheca stemonea</i>	Nb (NS)	1	
<i>Chaenothecopsis nigra</i>	Nb (NS)	1	
<i>Chaenothecopsis pusilla</i>	Nb (NS)	0	
<i>Cladonia incrassata</i>	Nb (NS)	1	
<i>Coenogonium tavaresianum</i>	Nb (NR)	1	<i>Dimerella tavaresiana</i>
<i>Lecidea nylanderii</i>	Nb (NS)	1	
<i>Micarea doliiformis</i>	Nb (NS)	1	
<i>Microcalicium ahlneri</i>	Nb (NS)	1	
<i>Opegrapha corticola</i>	Nb (IR)	1	
<i>Porina borrieri</i>	Nb (NS)	1	
<i>Porina byssophila</i>	Nb (NS)	1	
<i>Rinodina roboris</i> var. <i>roboris</i>	Nb (IR)	1	

<i>Schizotrema quercicola</i>	Nb (IR)	0	<i>Schismatomma quercicola</i>
<i>Scytinium subtile</i>	Nb (NS)	1	<i>Leptogium subtile</i>
<i>Sporodophoron cretaceum</i>	Nb (IR)	1	<i>Schismatomma cretaceum</i>
<i>Stenocybe septata</i>	Nb (IR)	1	
<i>Strigula taylorii</i>	Nb (NS/IR)	1	
Total number Nb species 2018 – 20		x	

This is an impressive lichen assemblage in the regional context and represents the richest lichen site in the & Thames Valley (Natural Character Area 115), with only the rather different and more pollution stressed Windsor Forest and Great Park SSSI (Sanderson, 2018c) approaching it. The site has a high score in the Pinhead Lichen Index, passing the SSSI threshold and is on the threshold of national interest for the Southern Oceanic Woodland Index, which is the richest site for this element in the Thames Valley. As well these features, there are five species that qualify for SSSI site selection in their own right as Threatened lichens in Britain. These are either Vulnerable or higher threatened species, or Near Threatened species that are International Responsibility species: *Bellicidia incompta* (*Bacidia incompta*), *Pertusaria pustulata*, *Pyrenula nitida*, *Scutula circumspecta* (*Bacidia circumspecta*) and *Porina hibernica*. Of these, *Bellicidia incompta* (*Bacidia incompta*), *Pyrenula nitida* and *Scutula circumspecta* (*Bacidia circumspecta*) clearly have viable populations of national significance at Burnham Beeches. Both *Pertusaria pustulata* and *Porina hibernica* were only found on single trees each, so the presence of viable populations here is not yet proven. In addition, *Pyrenula nitidella* was assessed as Extinct by Woods & Coppins (2012), but has since been refound and is probably likely to be assessed as at least Endangered in the next Red List so the population here will also be a feature of national significance.

4.1.2 Distribution of Interest

The distribution of lichen interest recorded in 2018 – 20 is shown on **Map 5**¹. This shows a major concentration of lichen interest in the main central valley centred on Mendelssohn's Slope but extending some way up valley and down valley to the southern part of Pumpkin Hill. This area includes concentrations of threatened (Vulnerable or higher) lichens and the moss *Zygodon forsteri* EN (NR/S41), found mainly on veteran Beech in flushed bark and wound track habitats. A similar but smaller concentration of rich Beech with threaten lichen and the moss *Zygodon forsteri* occurs in the south east of Crabtree Heath and within the old moat here.

Beyond this area are thinner scattered of trees of high interest in the rest of Crabtree Heath, Egypt Woods, Seven Ways Plain and the valley east of Lord Mayors Dive. These include some similar rich old Beeches, or rarely Oaks, with lichen interest in flushed bark and wound track habitats, in Egypt Woods and the rest of Crabtree Heath. Outside of the intense concentrations old Beech of interest, however lignum and dry bark on old Oaks habitats are more prominent. In the valley east of Lord Mayors Dive standing dead Oaks are the main habitats of lichen interest and it is also important in Egypt Woods.

¹ Including the moss *Zygodon forsteri* EN (NR/S41) included as an honorary lichen, as it shares habitat with several rare lichens.

4.1.3 Summary of Lichen Interest

The lichen interest of Burnham Beeches was greatly underrated in the old data, with the 2018 – 20 surveys adding numerous species of interest. The site supports the richest southern oceanic old growth woodland lichen assemblage in the Thames Basin and a nationally significant pinhead assemblage of specialist lichens on lignum and dry bark on old and standing Oak dead trees. The lichen assemblage includes four threatened species with nationally important populations, *Bellicidia incompta* (*Bacidia incompta*), *Pyrenula nitida*, *Pyrenula nitidella* and *Scutula circumspecta* (*Bacidia circumspecta*) and another two that were not proved to have viable populations, being only found once, but have their only known regional populations here. The lichen assemblage at Burnham Beeches has been badly damaged by past acidifying pollution. What survives, however, represents the richest surviving example of a southern oceanic Beech wood lichen assemblage known outside of the New Forest in Britain. Important habitats are flushed less acid bark, mainly on Beech, but also on Oak, associated wound track habitats, where the very rare moss *Zygodon forsteri* EN (NR/S41) is also found in association with rare lichens. Veteran Oaks, both alive and dead, also support significant assemblages in lignum and dry bark habitats.

The lichen interest is strongly associated with well-lit but sheltered veteran trees in the pasture woodlands. Some, but limited, colonisation by species of interest has occurred within the old growth stands on to younger trees, but almost nothing into adjacent maturing former enclosed woodlands as yet. This is a much more limited degree of colonisation that would be expected in clean air woodlands, such as the New Forest (Sanderson, 1996 & 2010). Under current conditions on the common, much of the lichen interest is highly dependent on the regular halo thinning around the veteran trees to prevent deep shade developing and destroying the lichen interest.

4.2 Management

4.2.1 Management Requirements of Woodland and Parkland Lichen Floras

The best conditions for woodland lichen assemblages are typically found in extensively grazed pasture woodland with a mixture of open high forest, glades and savanna like stands (Sanderson & Wolseley, 2001). The main positive features appear to be:

- Many trees surviving to senescence.
- Varying, but generally good light levels (with different lichen species having widely different tolerances).
- Shelter producing humid conditions.
- Slow woodland dynamics.

The basic mechanism driving this is a varying browsing pressure on tree regeneration that suppresses regeneration for long periods. A major interaction is between the shrub layer and the browsers; this can rapidly and drastically change the light and humidity levels without immediately altering the canopy layer (Coppins & Coppins

1998). Interactions between browsers and the canopy are much more long term, but frequent glades are required. Glades need to be dynamic but permanent features and slow dynamics are crucial. Coppins & Coppins (2002b), as an initial guide, suggest a requirement for at least 30% glades within the canopy of lichen rich woodlands and that the glades have a permanence of at least 30 years. In contrast, tree cover of less than 20 to 30% will result in the loss of woodland conditions and the resultant loss of the old growth dependent lichen assemblages. Exceptions to the latter are found in parklands with veteran trees with wide spreading crowns in very sheltered valley bottoms or humid areas. In very wet oceanic areas, woodland conditions can also be maintained with less shelter and more open areas. In these special conditions woodland lichen assemblages can survive in more open conditions.

There is no reason why such conditions could not be created by management outside of pasture woodlands, but this would not be easy. In particular it is important to appreciate the scale of management required. Rare lichens typically have very low rates of occupation, as they require specialised niches found on only a few veteran trees. As a result they tend to occur on very small numbers of trees within large populations of veteran trees. Each veteran tree will have different combinations of niches. Rather than just maintaining a few especially rich trees, sustainable management requires the maintenance of good conditions around dozens or hundreds of trees (depending of the size of the site), both veteran and maturing. To imitate browsing impacts fully, management would also be required to be annual. For example, without browsing, coppice regrowth around haloed veteran trees (trees with shrubs and maturing trees cut from around them) can cast a very dense shade on the lower trunks within three years or so. Extensive grazing appears to be the only practical method of maintaining large blocks of nationally or internationally important lichen rich woodland in the long term. Suitable conditions are unlikely to be found in woodlands managed efficiently for timber. Neither are they likely to be found within true non-intervention woodland with low browsing levels.

4.2.3 Comments on the Management of Burnham Beeches NNR for Lichens

The lichen assemblage at Burnham Beeches NNR has been damaged mainly by external acidifying pollution, but the decline and cessation of extensive grazing will also have had a negative impact. Potentially the loss of grazing could have led the loss of much of the surviving lichen interest to deep shade, but active management by halo thinning² has prevented this. Acidifying pollution has greatly declined and halo thinning around the living trees has basically saved the lichen interest that survived the acidifying pollution. Grazing is being restored to the NNR, but is still rather too light to actually impact on the woodland structure and maintain openness without a lot of continuing halo thinning.

The halo thinning is largely confined to live larger veteran trees, so standing dead Oaks are widely rather too shaded for really rich lichen assemblages to colonise. Also mature and younger post mature veteran trees, are potentially less available for

² Halo thinning is the term for cutting shading bushes and younger trees around the veterans, mainly to prevent over topping and completion, but also letting light in for the lower trunks epiphytes.

colonisation, as they tend to be more shaded than the conserved veterans. There has been some restructuring of the denser infill to produce a more open glade structure and this will be very positive for extending lichen habitat.

Some more detailed thoughts are given below on the main issues for lichen conservation in the future at Burnham Beeches.

4.2.4 Woodland Structure and Grazing

The needs of lichens will need to be balanced with other requirements and practicality. Considering lichens alone the following points are made. Most of these are concerned with extent and intensity of what is already under way, and may already be planned anyway.

Grazing: although this need not be as intense as it is in the New Forest, it does need to be high enough to be a check on tree regeneration, including Holly and to create a general browse line within the woods, including on Holly. This gets light on to the rich lower trunk habitat, even in quite dense stands. For this the grazing in the areas outside of the permanent fence needs to be higher.

Halo thinning veteran trees: as described above halo thinning the live veteran trees has been a life saver for the rare lichen assemblages. This treatment needs to be extended to the standing dead Oak trees. This should include both those shaded dead trees of lichen interest recorded during this survey (**Map 7**) and trees that were too shaded even for *Microcalicium ahlneri* Nb (NS) to survive. To continue to be beneficial for lichens the existing glades created halo thinning the live trees will need to be kept open to a greater degree than if the halo thinning was only intended to reduce inter-tree completion.

Restructuring stands derived out with grazing pressure: regeneration occurring under grazing pressure is patchy and tends to occur in more open areas away from the larger trees. Burnham Beeches was probably a bit too open for lichens and had had too little regeneration for veteran tree succession in the century or so before grazing stopped. However, the mass regeneration that has originated since grazing stopped is now far too dense. This needs restructuring to get large areas of the woodland back to the sort of structure that would have been produced if grazing had been maintained but some regeneration allowed. Just halo thinning veteran trees alone would be insufficient to create sustainable lichen habitat. This thinning needs to be uneven, locally creating glades, but leaving denser stands and damaged and poorly grown trees. Some of this sort of thinning has occurred already, but little has yet been carried out in the denser woodland in and near the lichen hot spots. Dense woodland between the halo thinned areas in Mendelssohn's Slope, for example needs to be treated.

Extent of old growth habitat: the area of old growth woodland is quite small compared to sites such as the New Forest. Given the small percentage of trees that rare lichens can occupy, larger areas are likely to be much more sustainable than small fragmented areas. Long term expansion of the old growth habitat is therefore

very desirable. The most obvious areas for expansion are the former coppices of New Coppice and Fleet Wood. They are close to existing rich areas, are deep within the woodland complex and already have large number of younger post mature trees. The closeness to existing hot spots is very important. Evidence from the New Forest suggests that specialist woodlands are good at closing with and adjacent to rich stands, but are poor at colonisation at distances of more than a few 100m (Sanderson, 1994 & 2010 & Wolseley et al, 2016). The central locations greatly favours extension of new old growth stands into New Coppice and Fleet Wood, as opposed to adjacent woodland to the north. This would also potentially be beneficial in the future, but would take longer to be effective.

In cleaner air areas the older stands within New Coppice and Fleet Wood would certainly already be well colonised by more mobile woodland lichens (Wolseley et al, 2016). Reduced populations within the surviving old growth stands due to past pollution, acidification of the developing veteran trees within the former coppices and increasing shade could have reduced the density of propagules and slowed down colonisation. Sanderson (2001) found that *Thelotrema lepadinum* could occupy over 400 trees and bushes per ha in old growth stands in areas where strong colonisation of more mobile lichens was occurring into adjacent 19th Oak stands. The density of this lichen in Burnham Beeches is probably about 3 – 4 occupied trees or bushes per ha at the densest, south of Burnham Walk. With improving conditions a gradual acceleration in lichen colonisation should occur as recovering populations build up numbers.

The stands in New Coppice and Fleet Wood will need some opening up locally, to let in more light, especially thinning Holly shrub layers and areas with denser young Beech regeneration. Also, grazing will need to maintain browse lines within the shrub layer.

Pollards: the role of pollards in lichen conservation is probably mainly historic. Working pollards resulted in the conservation of veteran trees in working and exploited pasture woodlands. Surveys of rare species in the New Forest, for example Sanderson (2009), found that there is no strong association with lapsed pollards for several rare Beech specialist lichens, including *Pyrenula nitida* VU (NR/S41) there. Naturally damaged maidens and leaning trees were more important habitats, probably mainly as because these were more frequent in a forest where pollarding was patchy. At Burnham Beeches nearly all the old Beeches are lapsed pollards. Here the programme of partial pollarding that has been carried out is essential to extend the life of the existing oldest trees as long as possible. The loss of some significant Beeches over just three years was noted during the survey. The role of new pollards for lichen conservation is not at all clear. It is possible that lapsed pollards are a better habitat for rare lichens than working pollards, but new pollards should certainly be cut to maintain the tradition and landscape of Burnham Beeches but retaining naturally damaged, leaning trees and suppressed slow growing trees will also be important in providing future lichen habitat.

4.2.5 Pollution Impacts and Mitigation

Air pollution has been a major impact damaging the lichen habitat in Burnham Beeches. Past acidifying pollution based on sulphur dioxide has rendered the majority of the veteran trees lichen poor. Richer trees represent trees whose bark was buffered to some degree protecting them from the impacts of acidification. With slow growing veteran trees that do not rapidly shed their bark, such as Oak and Beech, the long term impacts with the residual acidity lingering in the bark and delaying recovery. Acidification has greatly declined and has been low for some decades now. Many of the veteran trees, however, are still acidified but early stages of a recovery were evident in the field with species such as *Pyrenula nitida* VU (NR/S41) colonising into bare bark adjacent to their refuges. With time more, colonisation on to de-acidifying bark should occur.

Although acidification has declined, nitrogen based pollution has risen. This includes several different compounds with very different impacts on lichens. Ammonia based pollution, mainly from agricultural sources, but also from catalytic converters in petrol engines, has major visible impacts on epiphytic lichen communities (van Herk, 1999). This acts mainly through raising the pH of the bark and increasing the osmotic pressure of the water on the bark (Frahm, 2013). Ammonia tolerant lichen species are those of sunny dusty habitats or coastal habitats, which face similar chemical challenges in their natural habitats. Many species of conservation concern are intolerant of these conditions, especially ancient woodland species. The background levels of ammonia in the area of Burnham Beeches are modelled by the APIS website <<http://www.apis.ac.uk>> as between 1.28 – 1.63 $\mu\text{g m}^3$. This exceeds the critical level for lichens of 1.0 $\mu\text{g m}^3$. This is not impacting on the trunk communities, at least yet, but can be seen in the twig assemblages, where some nitrogen hating lichens survive but moderate nitrogen loving species are widespread. Very damaging ammonia pollution occurs at levels over about 2.0 $\mu\text{g m}^3$, when nitrogen-hating species disappear and species tolerant of high nitrogen pollution dominate, but this situation was not observed within the woods.

Ammonia is a short range pollutant that is significantly scrubbed out over distances of hundreds of meters, so the centre of Burnham Beeches is likely less polluted. Solutions mainly involve national policy, which had been much less successful in reducing ammonia pollution compared to sulphur and nitrogen oxides (Plantlife, 2017). However, maintaining denser woodland at the edges of the site and extending low intensity land use beyond the NNR to act as buffers would both help, with the latter the most effective.

The impact of nitrogen oxide pollution on lichens is not at all clear; where there is only nitrogen oxide without ammonia as in North Wales and the Lake District they appear to have similar but milder acidifying impacts as sulphur oxides. In these areas there is no evidence of the enriching impact seen from ammonia on epiphytic lichens. Given the severe impact of the more damaging sulphur dioxide pollution in the past, any nitrogen oxide impacts will be difficult to detect. Ideally it should be as low as possible. As long distant pollutants raised nitrogen oxide levels can only be mitigated by national policy.

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

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

Substrates

Co = Hazel, Ix = Holly, Fg = Beech, Ps = Scots Pine, Q = Oak, Sba = Whitebeam, Sb = Rowan, L = Lignum (as prefix) & Tw = twigs & branches. T = Terricolous

Hosts for lichenicolous fungi

Z0533 = *Graphis scripta*, Z0578 = *Hypocenomyce scalaris*.

Species in bold = systematically recorded species

Other

(DL) = Tree originally found by Dave Lamacraft

A1 Burnham Beeches 5/6/2020**A1.1 Weather**

Dry and sunny.

A1.2 Valley East of Lord Mayors Drive, SU9584, SU9484**SU9584**

Valley with ponds and adjacent plateau. Oaks high up with poor assemblages. *Chaenotheca ferruginea* on dry bark. Colonising *Parmelia* s. lat. on damp bark. Beech largely bare. Some post mature Pedunculate Oak and Beech but no lichen interest.

SU951 849**Other Species**

<i>Chaenotheca ferruginea</i>	Q
<i>Cladonia coniocraea</i>	LQ
<i>Evernia prunastri</i>	Q
<i>Evernia prunastri</i>	Q Tw
<i>Flavoparmelia caperata</i>	LQ, Q
<i>Fuscidea lightfootii</i>	Q Tw
<i>Hypotrachyna afrorevoluta</i>	Q Tw
<i>Lecanora symmicta</i>	LQ
<i>Melanelixia glabratula</i>	LQ, Q
<i>Melanelixia subaurifera</i>	Q Tw
<i>Parmelia saxatilis</i> s. lat.	Q
<i>Parmelia sulcata</i>	Q Tw
<i>Physcia tenella</i>	Q Tw
<i>Pyrrhospora quernea</i>	Q

SU951 848**Other Species**

<i>Chaenotheca ferruginea</i>	Fg,Q
<i>Cladonia coniocraea</i>	Q
<i>Lecanora expallens</i>	Fg, Q
<i>Parmelia saxatilis</i> s. lat.	Q
<i>Parmelia sulcata</i>	Q
<i>Parmotrema perlatum</i>	Q
<i>Phlyctis argena</i>	Q
<i>Ramalina farinacea</i>	Q
<i>Xanthoria parietina</i>	Fg

SU952 848

<i>Diarthonis spadicea</i>	Q
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Below Upper Pond

More old trees but a lot of very dense high forest developed.

SU9510 8475 ancient Beech**Species of Interest**

<i>Enterographa crassa</i>	Fg	
<i>Porina borrieri</i>	Fg	Coll. 1

Other Species

<i>Graphis scripta</i>	Fg
<i>Opegrapha vermicellifera</i>	Fg
<i>Pertusaria hymenea</i>	Fg

SU951 847**Species of Interest**

<i>Enterographa crassa</i>	Fg	
<i>Porina borrieri</i>	Fg	Coll. 1

Other Species

<i>Bacidina adastrata</i>	Fg
<i>Diarthonis spadicea</i>	Ix
<i>Dimerella pineti</i>	Fg
<i>Graphis elegans</i>	Fg
<i>Graphis scripta</i>	Fg
<i>Lepraria finkii</i>	Fg
<i>Opegrapha vermicellifera</i>	Fg
<i>Opegrapha vulgata</i>	Fg
<i>Pertusaria hymenea</i>	Fg
<i>Phlyctis argena</i>	Fg

SU950 847**Other Species**

<i>Diarthonis spadicea</i>	Q
<i>Lecanactis abietina</i>	Q

Lepraria finkii

Q

SU950 846**BUB010** (SU95005 84680, 80m) (DL tree): huge dead Oak pollard, very shaded*Chaenothecopsis nigra* LQ O Coll. 1 Septa darker than cell walls*Microcalicium ahlneri* LQ A

Photo 2020-06-05-01

SU950 846**Species of Interest***Chaenothecopsis nigra* LQ*Microcalicium ahlneri* LQ*Scoliosporum pruinosum* Q SU9501 8468**SU950 847****Species of Interest***Enterographa crassa* Fg SU9499 8475 Propped fragment of Beech pollard**Other Species***Buellia griseovirens* Fg**SU9484****SU949 847**

Gravel pit banks

SU949 847**Species of Interest***Cladonia caespiticia* T Sterile but confirmed elsewhere**Other Species***Trapeliopsis pseudogranulosa* T*Micarea prasina* s. lat. T**SU949 846****BUB011** (SU94952 84628, 65m) (DL tree): standing dead Oak Pollard shaded by Holly*Chaenothecopsis nigra* LQ R (not coll.)*Microcalicium ahlneri* LQ F**SU949 846****Species of Interest***Chaenothecopsis nigra* LQ (not coll.)*Cladonia caespiticia* T Sterile but confirmed elsewhere*Enterographa crassa* Fg SU9494 8467 Roots of old Beech in gravel pit

Microcalicium ahlneri LQ

SU949 845

Species of Interest

Chaenotheca trichialis Q SU9491 8457 tag 1392 ancient
Pedunculate Oak in glade

Other Species

Chaenotheca ferruginea Q
Lecanora expallens Q

East of Middle Pond towards Heath

Some dead old Oaks of interest, over topped by Beech

SU9584

SU950 845

BUB012 (SU95056 84548 ±7m, 65m): standing dead Oak pollard in dense Beech –
Holly developing high forest by path

Chaenothecopsis nigra LQ O Coll. 2 Septa darker than cell
walls

Microcalicium ahlneri LQ F

Photo 2020-06-05-05

SU950 845

Species of Interest

Chaenotheca trichialis Q SU9503 8451 standing dead Oak pollard

Chaenothecopsis nigra LQ

Microcalicium ahlneri LQ

SU950 846

BUB013 (SU95043 84630 ±7m, 69m): ancient Pedunculate Oak pollard one stem alive,
in glade

Chaenothecopsis nigra LQ R Not collected

Cladonia incrassata LQ O

Microcalicium ahlneri LQ R

Also

Chaenotheca trichialis Q

Cladonia polydactyla LQ

Diarthonis spadicea Q

Trapeliopsis flexuosa LQ

Photo 2020-06-05-03

BUB014 (SU95085 84638 ±8m, 75m): standing dead Oak pollard in deep shaded of
Beech and Holly

Microcalicium ahlneri LQ F

Photo 2020-06-05-04

SU950 846**Species of Interest**

<i>Chaenothecopsis nigra</i>	LQ
<i>Cladonia incrassata</i>	LQ
<i>Microcalicium ahlneri</i>	LQ
<i>Chaenotheca trichialis</i>	Q

Other Species

<i>Cladonia polydactyla</i>	LQ
<i>Diarthonis spadicea</i>	Q
<i>Trapeliopsis flexuosa</i>	LQ

SU9484

West side below lake, nothing much, dark, no veterans

SU949 845**Species of Interest**

<i>Porina byssophila</i>	Fg
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Other Species

<i>Anisomeridium polypori</i>	Fg
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A1.3 Seven Ways Plain, SU9484Trees more exposed but better lit and some lichen interest on scattered veteran Oak.
No colonisation on to younger trees.**SU948 845****BUB015** (SU94825 84589, 74m): big spreading ancient Pedunculate Oak in fenced enclosure

<i>Chaenotheca stemonea</i>	Q	O	Sterile Pd + Y
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Also

<i>Cladonia coniocraea</i>	Q, LQ
<i>Cladonia fimbriata</i>	Q

Photo 2020-06-05-06

SU948 846**BUB016** (SU94902 84622, 69m): ancient Pedunculate Oak pollard in glade in infill

<i>Chaenotheca chrysocephala</i>	Q	O
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<i>Chaenotheca stemonea</i>	Q	O
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Also

<i>Chaenotheca trichialis</i>	Q
<i>Chrysothrix flavovirens</i>	Q

SU949 846

BUB017 (SU94920 84649, 64m): ancient Oak pollard in glade

<i>Chaenotheca stemonea</i>	Q	R	
<i>Cresponea premnea</i>	Q	R	Single thallus, colonist?
<i>Lecidea nylanderi</i>	LQ	O	On dead branch

Also

<i>Micarea viridileprosa</i>	Q		
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Photo 2020-06-05-08

SU949 846

Species of Interest

<i>Chaenotheca stemonea</i>	Q		
<i>Cresponea premnea</i>	Q		
<i>Lecidea nylanderi</i>	LQ		

Other Species

<i>Micarea viridileprosa</i>	Q		
<i>Trapeliopsis flexuosa</i>	LQ		
<i>Trapeliopsis pseudogranulosa</i>	LQ		

SU948 847

BUB018 (SU94860 84739, 62m): standing dead Oak pollard in glade edge

<i>Microcalicium ahlneri</i>	LQ	O	
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Also

<i>Chaenotheca ferruginea</i>	LQ		
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Photo 2020-06-05-09

SU948 847

Species of Interest

<i>Enterographa crassa</i>	Fg	SU9482 8476
<i>Microcalicium ahlneri</i>	LQ	

Other Species

<i>Chaenotheca ferruginea</i>	LQ	
<i>Dendrographa decolorans</i>	Fg	
<i>Graphis scripta</i>	Fg	
<i>Lecanora expallens</i>	Fg	
<i>Pseudoschimatomma rufescens</i>	Fg	Coll.
<i>Pyrrhospora quernea</i>	Fg	

SU949 848

BUB019 (SU94927 84832, 67m): ancient Pedunculate Oak pollard in open

<i>Loxospora elatina</i>	Q	F
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Also

<i>Amandinea punctata</i>	Q	
<i>Chaenotheca trichialis</i>	Q	R
<i>Chrysothrix flavovirens</i>	Q	
<i>Cladonia polydactyla</i>	Q	

<i>Cliostomum griffithii</i>	Q	
<i>Hypocenomyce scalaris</i>	Q	
<i>Micarea viridileprosa</i>	Q	
<i>Pyrrhospora quernea</i>	Q	
Photo 2020-06-05-10 – 11 (in 11 white patches = <i>Loxospora elatina</i>)		

BUB020 (SU94906 84856, 64m): Pedunculate Oak pollard with much lignum exposed in open

<i>Chaenotheca brunneola</i>	LQ	
<i>Lecidea nylanderii</i>	LQ, Q	
<i>Microcalicium ahlneri</i>	LQ	O
Also		
<i>Hypocenomyce scalaris</i>	LQ	
<i>Lecanora conizaeoides f. conizaeoides</i>		LQ, Q
Photo 2020-06-05-13		

SU949 848

Species of Interest

<i>Chaenotheca brunneola</i>	LQ	
<i>Chaenotheca trichialis</i>	Q	
<i>Lecidea nylanderii</i>	LQ, Q	
<i>Loxospora elatina</i>	Q	
<i>Microcalicium ahlneri</i>	LQ	

Other Species

<i>Amandinea punctata</i>	Q, Fg	
<i>Chrysothrix flavovirens</i>	Q	
<i>Cladonia polydactyla</i>	Q	
<i>Cliostomum griffithii</i>	Q	
<i>Hypocenomyce scalaris</i>	LQ	
<i>Hypocenomyce scalaris</i>	Q	
<i>Lecanora conizaeoides f. conizaeoides</i>		LQ, Q
<i>Micarea viridileprosa</i>	Q	
<i>Pyrrhospora quernea</i>	Q	

SU9584

SU950 848

BUB021 (SU95019 84860, 70m): standing dead Oak pollard in open

<i>Microcalicium ahlneri</i>	LQ	O
Also		
<i>Calicium glaucellum</i>	LQ	
<i>Chrysothrix flavovirens</i>	LQ	
<i>Cladonia digitata</i>	LQ	
<i>Micarea melaena</i>	LQ	

Photo 2020-06-05-12

SU950 849**Other Species**

Lecidella elaeochroma f. *elaeochroma* Fg
Ochrolechia microstictoides Q

A1.4 Victoria Drive Valley & Mendelssohn's Slope, SU9584

The main valley outside of the fenced grazing area, includes many very rich Beeches and some Oak interest. Most of the richer old trees are in manually maintained glades that have prevented shading.

SU950 849

BUB022 (SU95006 84956, 63m): ancient hollow Beech

Bellicidia incompta LFg O Inside hollow

Photos 2020-06-05-14 & 15 + Skitch

BUB023 (SU94999 85000, 58m) (DL tree): hollow Beech in glade Tag 01351

Bellicidia incompta Fg O Wound on bark

Also

Arthonia radiata Fg

Enterographa crassa Fg

Opegrapha vermicellifera Fg, LFg

Porina borrieri Fg

Porina leptalea Fg

Photos 2020-06-05-16, 17 & Skitch

BUB024 (SU95006 84982, 64m) (DL tree): ancient Pedunculate Oak by glade Tag 1348

Cresponea premnea Q DL 03/04/2019 not refound

Also

Thelotrema lepadinum Q

SU950 849**Species of Interest**

Bellicidia incompta LFg, Fg

Cresponea premnea Q

Enterographa crassa Fg

Enterographa crassa Fg SU9497 8500

Porina borrieri Fg

Thelotrema lepadinum Q

Other Species

Arthonia radiata Fg

Diarthonis spadicea Fg

Opegrapha vermicellifera Fg, LFg

Porina leptalea Fg

SU949550

BUB025 (SU94950 85000, 60m) (First recorded 21/9/18): ancient Beech by glade with rich base rich flushed bark

Recorded 21/9/18:

<i>Agonimia flabelliformis</i>	Fg		
<i>Lecanora jamesii</i>	Fg		
<i>Scutula circumspecta</i>	Fg	O	Coll. Spores 3 septate 22 – 27 x 2um; epithecium green, K –, N + violet; exciple dark purple brown & K + purple intensifying above, clear below; hypothecium mostly clear, thin upper area straw coloured. Coll. Herb Sanderson 2449.

<i>Thelopsis rubella</i>	Fg	Coll.	
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Recorded 5/6/2020:

<i>Bellicidia incompta</i>	Fg	R	
<i>Pyrenula cf nitida</i>	Fg	R	Sterile but looks to be this

Also

<i>Enterographa crassa</i>	Fg		
<i>Opegrapha vermicellifera</i>	Fg		
<i>Graphis scripta</i>	Fg		
<i>Coniocarpon cinnabarinum</i>	Fg		
<i>Pertusaria hymenea</i>	Fg		

BUB026 (SU94944 85022) (First recorded 21/9/18): a Beech pollard tag 01347 in dense infill Beech by glade with young Beech cut to the south.

Recorded 21/9/18:

<i>Pyrenula nitida</i>	Fg	O	3 large thalli, K + P, 5 colonists above
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Also

<i>Enterographa crassa</i>	Fg		
<i>Graphis scripta</i>	Fg		
<i>Pertusaria hymenea</i>	Fg		
<i>Porina byssophila</i>	Fg		

Recorded 5/6/2020:

<i>Scutula circumspecta</i>	Fg	Coll. 4	
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Also

<i>Taeniolella punctata</i>	Fg, Z0533		
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SU949550

Species of Interest

<i>Agonimia flabelliformis</i>	Fg		
<i>Enterographa crassa</i>	Fg		
<i>Bellicidia incompta</i>	Fg		
<i>Coniocarpon cinnabarinum</i>	Fg		
<i>Lecanora jamesii</i>	Fg		
<i>Porina byssophila</i>	Fg		
<i>Pyrenula nitida</i>	Fg		
<i>Scutula circumspecta</i>	Fg		

<i>Thelopsis rubella</i>	Fg
Other Species	
<i>Graphis scripta</i>	Fg
<i>Graphis scripta</i>	Fg
<i>Opegrapha vermicellifera</i>	
<i>Pertusaria hymenea</i>	Fg
<i>Taeniolella punctata</i>	Fg, Z0533

SU9484**SU949 849****BUB032** (SU94930 84999, 74m) ancient Beech by glade

<i>Sporodophoron cretaceum</i>	Fg	R
Also		
<i>Bacidina phacodes</i>	Fg	
<i>Enterographa crassa</i>	Fg	
<i>Opegrapha atra</i>	Fg	
<i>Opegrapha varia</i>	Fg	Coll. 4
<i>Porina borrieri</i>	Fg	
<i>Strigula taylorii</i>	Fg	
<i>Thelotrema lepadinum</i>	Fg	

BUB027 (SU94923 84977, 58m): ancient Beech pollard by small glade. Tag 01341

<i>Bellicidia incompta</i>	Fg	F	On root buttress
Also			
<i>Cliostomum griffithii</i>	Fg		

Photo 2029-06-05-18 & Skitch

BUB028 (SU94924 84963, 60m) post mature Pedunculate Oak tree grown from coppice stool, shaded by Holly

<i>Loxospora elatina</i>	Q	O	Colonising?
Also			
<i>Diarthonis spadicea</i>	Q		

Photo 2020-06-05-18

BUB029 (SU94894 84956, 56m) (*Pyrenula nitida* New 2): ancient Beech pollard on edge of glade. Tag 01326

Recorded 21/9/18:

<i>Opegrapha corticola</i>	Fg		
<i>Pyrenula cf nitida</i>	Fg	O	Sterile but looks to be this
Also			
<i>Bacidina phacodes</i>	Fg		
<i>Coniocarpon cinnabarinum</i>	Fg		
<i>Normandina acroglypta</i>	Fg		
Recorded 5/6/2020:			
<i>Enterographa crassa</i>	Fg		

Porina borrieri Fg
Strigula taylorii Fg
 Photo 2020-06-05-19

SU949 849**Species of Interest**

Bacidina phacodes Fg
Bellicidia incompta Fg
Coniocarpon cinnabarinum Fg
Enterographa crassa Fg
Loxospora elatina Q
Normandina acroglypta Fg
Porina borrieri Fg
Sporodophoron cretaceum Fg
Strigula taylorii Fg
Thelotrema lepadinum Fg

Other Species

Diarthonis spadicea Q
Cliostomum griffithii Fg
Opegrapha atra Fg
Opegrapha varia Fg

SU948 849

SU9488 8496 ancient Beech

BUB030 (SU94890 84947, 56m) still standing in 21/9/18, but fallen by 5/6/2020 and dead

Recorded 21/9/18:

Scutula circumspecta Fg

Recorded 5/6/2020:

Enterographa crassa Fg
Porina borrieri Fg

BUB031 (SU94860 84959, 53m): ancient Beech by glade with rich flush bark and wound track

Lecanora jamesii Fg F K/UV + bright Y
Porina hibernica Fg Coll. Herb. Sanderson 2774. Orange isidia without cortex, 50 – 75µm diameter
Pyrenula nitida Fg R One thallus
Scytinium subtile Fg Coll. Herb. Sanderson 2774. Squamules with cortex on both sides.
Zygodon forsteri Fg O
 Also
Bacidina phacodes Fg
Phlyctis argena Fg

Photos 2020-06-05-21, 22 & Skitch 1 Pyrenula nitida Magenta, 2 Zygodon forsteri Yellow & Porina hibernica & b Scytinium subtile Orange

SU948 849

Species of Interest

<i>Chaenotheca brachypoda</i>	LFg	SU9484 8496
<i>Enterographa crassa</i>	Fg	SU9485 8494, SU9488 8496
<i>Lecanora jamesii</i>	Fg	
<i>Porina borneri</i>	Fg	SU9488 8496
<i>Porina hibernica</i>	Fg	
<i>Pyrenula nitida</i>	Fg	
<i>Scutula circumspecta</i>	Fg	
<i>Scytinium subtile</i>	Fg	
<i>Strigula taylorii</i>	Fg	SU9488 8496

Other Species

<i>Cladonia digitata</i>	LQ	
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Bryophyte of Interest

<i>Zygodon forsteri</i>	Fg	
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SU948 848

Species of Interest

<i>Enterographa crassa</i>	Fg	SU9480 8489
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A2 Burnham Beeches 9/6/2020**A2.1 Weather**

Dry and sunny.

A2.2 Victoria Drive Valley & Mendelssohn's Slope

Worked along the top edge of east section of the main valley above Burnham Walk.

SU9585**SU952 850**

Old Beech by road, not rich but some relic lichen interest

SU952 850**Species of Interest***Enterographa crassa* Fg SU9524 8507*Thelotrema lepadinum* Fg SU9524 8507**SU951 850**

Again some ancient Beech pollards, not rich but some relic lichen interest

SU951 850**Species of Interest***Enterographa crassa* Fg SU9513 8502, SU9512 8502*Thelotrema lepadinum* Fg SU9513 8502**Other Species***Caloplaca obscurella* Fg SU9513 8502*Cliostomum griffithii* Fg*Dendrographa decolorans* Fg SU9513 8502*Lecanora expallens* Fg*Opegrapha vulgata* Fg*Pertusaria hymenea* Fg**SU9584****SU950 849**

Some ancient Beech pollards, not rich but some relic lichen interest

BUB033 (SU95048 84980, 61m): ancient broken Pedunculate Oak pollard. Tag 01308*Loxospora elatina* Q O

Also

Chrysothrix flavovirens Q**Photo** 2020-06-09-01**SU950 849****Species of Interest***Loxospora elatina* Q

<i>Pyrenula chlorospila</i>	Fg	SU9505 8498
<i>Thelotrema lepadinum</i>	Fg	SU9502 8499
Other Species		
<i>Dendrographa decolorans</i>	Fg	SU9505 8498
<i>Chrysothrix flavovirens</i>	Q	

SU9484**SU949 849****Species of Interest**

<i>Thelotrema lepadinum</i>	Fg	
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Other Species

<i>Cladonia digitata</i>	LQ	
<i>Cladonia macilenta</i>	LQ	
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>	LQ	

SU948 848**Other Species**

<i>Graphis elegans</i>	Q	
<i>Lecanactis abietina</i>	Q	

SU948 849

Working west beyond the stop point on 5/6/2020. Found more rich trees.

BUB034 (SU94814 84898): an ancient Beech pollard, which was standing in 21/9/18, but had fallen by 9/6/2020.

Recorded 21/9/18:

<i>Pyrenula nitida</i>	Fg	3 thalli
<i>Sporodophoron cretaceum</i>	Fg	

Also

<i>Coniocarpon cinnabarinum</i>	Fg	
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Recorded 9/6/2020:

<i>Bacidina phacodes</i>	Fg	
<i>Enterographa crassa</i>	Fg	
<i>Gyalecta truncigena</i>	Fg	
<i>Opegrapha sorediifera</i>	Fg	

Photo 2020-06-09-02

SU948 849**Species of Interest**

<i>Bacidina phacodes</i>	Fg	
<i>Enterographa crassa</i>	Fg	SU9488 8494, SU9480 8492
<i>Porina borrieri</i>	Fg	SU9488 8494
<i>Pyrenula nitida</i>	Fg	
<i>Sporodophoron cretaceum</i>	Fg	

Other Species

<i>Candelariella xanthostigmoides</i>	Fg	
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Normandina pulchella Fg
Opegrapha vermicellifera Fg

SU947 848**Species of Interest**

Enterographa crassa Fg SU9479 8488

Other Species

Dendrographa decolorans Fg SU9479 8488

Graphis scripta Fg

Pertusaria pertusa Fg

SU947 849**Species of Interest**

Enterographa crassa Fg SU9479 8495

Strigula taylorii Fg SU9479 8495

Other Species

Cladonia coniocraea LQ

Cladonia digitata LQ

SU948 848

BUB036 (SU94810 84882, 67m): ancient Beech pollard in glade

Rinodina roboris var. *roboris* Fg R

Also

Enterographa crassa Fg

Photo 2020-06-09-04

BUB035 (SU94744 84830, 65m): open hollow ancient Beech pollard. Tag 01221

Chaenotheca hispidula LFg O

Photo 2020-06-09-03 & Skitch

SU947 848**SU947 848****Species of Interest**

Enterographa crassa Fg SU9472 8482

Porina byssophila Fg

SU946 848

Working through another concentration of rich veteran Beech, with several new trees found

BUB001 (SU94688 84837, 37m): first recorded 02/04/19, an ancient Beech pollard.

Tag 01214. All species refound 9/6/2020.

Recorded 02/04/19

Opegrapha corticola Fg R On base

Recorded 9/6/2020

Also

<i>Dendrographa decolorans</i>	Fg
<i>Enterographa crassa</i>	Fg
<i>Opegrapha atra</i>	Fg
<i>Thelotrema lepadinum</i>	Fg

Photo 2020-06-09-05

BUB037 (SU94674 84833, 62m): ancient Beech pollard on glade edge. Tag 01217

<i>Pyrenula nitida</i>	Fg	O	two patches perithecia K + P
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Also

<i>Enterographa crassa</i>	Fg
<i>Porina byssophila</i>	Fg

Photos 2020-05-09-06 & 7

SU946 848**Species of Interest**

<i>Enterographa crassa</i>	Fg	SU9469 8483
<i>Opegrapha corticola</i>	Fg	
<i>Porina byssophila</i>	Fg	
<i>Pyrenula nitida</i>	Fg	
<i>Thelotrema lepadinum</i>	Q	SU9466 8481

Other Species

<i>Dendrographa decolorans</i>	Fg
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SU946 847**BUB002** (SU94616 84793, 37m): first recorded 02/04/19, ancient Beech pollard on glade edge. Tag 01195. All species refound 9/6/2020.

Recorded 02/04/19

<i>Pyrenula nitidella</i>	Fg	R	
<i>Scutula circumspecta</i>	Fg	O	Blue pins
<i>Thelopsis rubella</i>	Fg	O	

Recorded 9/6/2020

<i>Pyrenula nitida</i>	Fg	R	One small fertile thalli few other sterile ones, magenta pin
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Also

<i>Enterographa crassa</i>	Fg
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Photos 2020-06-09-08 – 10

BUB003 (SU94611 84805, 38m): first recorded 02/04/19, ancient Beech pollard in glade edge. Tag 01194. All species refound 9/6/2020.

Recorded 02/04/19

<i>Pyrenula nitida</i>	Fg	R	Two thalli magenta pins
<i>Pyrenula nitidella</i>	Fg	O	Blue pins

Recorded 9/6/2020

Also

<i>Enterographa crassa</i>	Fg
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Porina borrieri Fg
Porina byssophila Fg
 Photos 2020-06-09-10 & 11 below in 10

BUB038 (SU94573 84802, 60m): ancient Beech pollard by partial glade. Tag 01192

Pyrenula nitida Fg R Magenta pin
Pyrenula nitidella Fg R Blue pin

Also

Enterographa crassa Fg
Diarthonis spadicea Fg
Porina byssophila Fg

Photos 2020-06-09-12 & 13

BUB039 (SU94551 84776, 58m): ancient Beech pollard just up from path. Tag 01190

Pyrenula nitida R Two small thalli

Also

Bacidina phacodes Fg
Enterographa crassa Fg
Porina borrieri Fg
Porina byssophila Fg

Photos 2020-06-09-14 & 15

BUB004 (SU94571 84771, 42m): ancient Beech pollard by glade

Pyrenula nitida Fg F Scattered small thalli (all pins plus two more below right green) on north side

Also

Enterographa crassa Fg
Porina borrieri Fg
Porina byssophila Fg

Photo 2020-05-09-16

SU946 847

Species of Interest

Enterographa crassa Fg SU9462 8477
Porina borrieri Fg
Porina byssophila Fg
Pyrenula nitida Fg
Pyrenula nitidella Fg
Scutula circumspecta Fg
Thelopsis rubella Fg

Other Species

Diarthonis spadicea Fg

SU946 847

BUB040 (SU94604 84713, 63m): hollow Beech pollard in glade. Tag 01174

<i>Bellicidia incompta</i>	LFg	F	Inside trunk c 0.4 x 1m
Also			
<i>Arthonia radiata</i>	Fg		
<i>Enterographa crassa</i>	Fg		
<i>Thelotrema lepadinum</i>	Fg		
Photo 2020-06-09-17			

SU946 847**Species of Interest**

<i>Bellicidia incompta</i>	LFg		
<i>Enterographa crassa</i>	Fg		
<i>Thelotrema lepadinum</i>	Fg		

Other Species

<i>Arthonia radiata</i>	Fg		
<i>Hypocenomyce scalaris</i>	LQ		

A2.3 West of Seven Ways Plain

North west of Seven Ways Plain in older grazing area, similar to the rest of Seven Ways Plain, Beech poorer but better pinhead assemblage on Oak.

SU946 847

BUB041 (SU94647 84728, 57m): ancient hollow Pedunculate Oak pollard in glade. Tag 01181

<i>Loxospora elatina</i>	Q	F	
Also			
<i>Cladonia digitata</i>	Q, LQ		

Photo 2029-06-09-18, *Loxospora elatina* white

BUB042 (SU94687 84745, 55m): standing dead Oak pollard, Holly shaded

<i>Chaenothecopsis nigra</i>	LQ	R	
<i>Microcalicium ahlneri</i>	LQ	O	

Photo 2020-06-09-19

SU946 847**Species of Interest**

<i>Chaenothecopsis nigra</i>	LQ		
<i>Enterographa crassa</i>	Fg		SU9464 8473
<i>Loxospora elatina</i>	Q		
<i>Microcalicium ahlneri</i>	LQ		
<i>Thelotrema lepadinum</i>	Q		SU9464 8473

Other Species

<i>Cladonia digitata</i>	Q, LQ		
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SU946 846**Species of Interest**

<i>Enterographa crassa</i>	Fg		SU9468 8468
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SU947 846**Species of Interest**

<i>Chaenotheca trichialis</i>	Q	SU9472 8463
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A2.4 Juniper Grove

Mature Beech high forest in gravel pit, no lichen interest.

SU945 846**Other Species**

<i>Psilolechia lucida</i>	Terr	
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A2.5 Pumpkin Hill, SU9484, SU9485

Includes a grove of rich ancient Beech and along with a scatter of trees of interest beyond this including the richest Oak found at Burnham. All the best trees were in maintained glades.

Slopes**SU945 847**

Interest on a standing dead Beech.

SU945 847**Species of Interest**

<i>Chaenotheca brachypoda</i>	LFg	SU9450 8475
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Other Species

<i>Opegrapha ochrocheila</i>	LFg	
<i>Psoroglaena stigonemoides</i>	Fg	

SU944 847

A post mature Pedunculate Oak in gravel pit bank had a rare instance of colonisation by *Enterographa crassa* on to a younger veteran tree.

SU944 847**Species of Interest**

<i>Enterographa crassa</i>	QSU9442	8473
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SU943 847

BUB005 (SU94394 84724, 42m): first recorded 02/04/19, ancient maiden Pedunculate Oak above gravel pit in glade with a remarkable lichen assemblage.

Recorded 02/04/19

<i>Agonimia flabelliformis</i>	Q	O
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<i>Opegrapha corticola</i>	Q	F
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Also

<i>Pertusaria flavida</i>	Q	O
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Recorded 9/6/2020

<i>Anisomeridium ranunculosporum</i>	Q	R
<i>Cresponea premnea</i>	Q	R
<i>Pachyphiale carneola</i>	Q	O
<i>Porina multipuncta</i>	Q	R
<i>Sporodophoron cretaceum</i>	Q	R
Also		
<i>Anisomeridium polypori</i>	Q	
<i>Bacidina phacodes</i>	Q	
<i>Cliostomum griffithii</i>	Q	
<i>Dendrographa decolorans</i>		
<i>Enterographa crassa</i>	Q	
<i>Lecanora argentata</i>	Q	Coll.
<i>Opegrapha vermicellifera</i>	Q	
<i>Pertusaria hymenea</i>	Q	
<i>Pyrrhospora quernea</i>	Q	
Photo 2020-06-09-20		

SU9436 847**Species of Interest**

<i>Agonimia flabelliformis</i>	Q	
<i>Anisomeridium ranunculosporum</i>	Q	
<i>Bacidina phacodes</i>	Q	
<i>Cresponea premnea</i>	Q	
<i>Enterographa crassa</i>	Q, Fg	SU9436 8474 (Fg)
<i>Opegrapha corticola</i>	Q	
<i>Pachyphiale carneola</i>	Q	
<i>Porina multipuncta</i>	Q	
<i>Sporodophoron cretaceum</i>	Q	

Other Species

<i>Anisomeridium polypori</i>	Q	
<i>Cliostomum griffithii</i>	Q	
<i>Dendrographa decolorans</i>		
<i>Lecanora argentata</i>	Q	Coll.
<i>Opegrapha vermicellifera</i>	Q, Fg	
<i>Pertusaria hymenea</i>	Q	
<i>Pyrrhospora quernea</i>	Q	

SU943 846

BUB043 (SU94368 84666, 59): broken ancient Beech pollard by path. Tag 01163

<i>Pyrenula nitida</i>	Fg	O	Five small to medium patches
Also			
<i>Enterographa crassa</i>	Fg		
<i>Graphis scripta</i>	Fg		

Photos 2020-06-09-21 & 22

SU943 848

A grove of rich old Beech, with some old oak pollards also of high interest, glades maintained around trees.

BUB006 (SU94372 84814, 58m): first recorded 02/04/19, ancient Beech pollard in glade, browse line descending, interest refound 9/6/2020. Tag 01156

Zygodon forsteri LFG In root knot hole

Also

Dendrographa decolorans Fg

Enterographa crassa Fg

Photos 2020-06-09-23 & 24

BUB044 (SU94361 84831, 55m): ancient Beech pollard in glade. Tag 01155

Opegrapha corticola Fg O

Sporodophoron cretaceum Fg R

Also

Coniocarpon cinnabarinum Fg

Enterographa crassa Fg

Opegrapha atra Fg

Opegrapha varia LFG

Photo 2020-06-09-25

BUB007 (SU94331 84838, 49m): first recorded 02/04/19, ancient Beech pollard open area, interest refound and added to 9/6/2020. Tag 051150

Recorded 02/04/19

Bellicidia incompta LFG, Fg F Several streaks inside hollow and on bark

Recorded 9/6/2020

Zygodon forsteri Fg R Small tuft on root knothole

Also

Enterographa crassa Fg

Porina byssophila Fg

Photo 2030-06-08-25 back ground

BUB045 (SU94338 84829, 49m): ancient Beech pollard in open area. Tag 01152

Zygodon forsteri Fg R One tuft on root boss

Also

Enterographa crassa Fg

Photos 2020-06-09- 26 & 27

BUB046 (SU94329 84834, 52m): ancient Beech pollard in open area. Tag 01151

Bellicidia incompta LFG O Streak inside hollow

Thelopsis rubella Fg R

Also

Enterographa crassa Fg

Porina borrieri Fg

Photo 2030-06-08-28

BUB047 (SU94332 84843, 53m): ancient Quercus x rosacea pollard in open area
Cresponea premnea Q O
 Photo 2020-06-09-29

BUB048 (SU94312 84835, 54m): ancient Quercus x rosacea pollard in open area
Cresponea premnea Q O
 Also
Chaenotheca trichialis Q
 Photo 2020-06-08-30

SU943 848

Species of Interest

<i>Bellicidia incompta</i>	LFg	
<i>Chaenotheca trichialis</i>	Q	
<i>Coniocarpon cinnabarinum</i>	Fg	
<i>Cresponea premnea</i>	Q	
<i>Enterographa crassa</i>	Fg	SU9438 8481
<i>Opegrapha atra</i>	Fg	
<i>Opegrapha corticola</i>	Fg	
<i>Opegrapha varia</i>	LFg	
<i>Porina borrieri</i>	Fg	SU9438 8481
<i>Porina byssophila</i>	Fg	
<i>Sporodophoron cretaceum</i>	Fg	
<i>Thelopsis rubella</i>	Fg	

Bryophytes

<i>Zygodon forsteri</i>	LFg
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Other Species

<i>Dendrographa decolorans</i>	Fg
<i>Pertusaria hymenea</i>	Fg

Top of the hill

Uphill mostly younger Oak, with rare veteran trees, so lichen interest much reduced.

SU9485

SU941 850

Rare old Oak of interest here

BUB049 (SU94170 85014, 50m): post mature Pedunculate Oak pollard by partial glade. Tag 01141.

<i>Chaenotheca stemonea</i>	Q	F
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A2.6 Crabtree Heath, SU9485

Started exploring Crabtree Heath from the west, with some dry bark and lignum interest on veteran and standing dead Oaks and the edge of another area of rich Beech.

SU942 852**BUB050** (SU94259 85254, 62m): standing dead Oak by road*Chaenothecopsis nigra* LQ R Coll.*Microcalicium ahlneri* LQ O

Photo 2020-06-08-31

BUB051 (SU94266 85241, 63m): standing dead Oak near the road*Chaenothecopsis nigra* R Not Coll.**BUB052** (SU94274 85249, 66m): ancient *Quercus x rosacea* pollard*Chaenotheca stemonea* Q R

Also

Thelotrema lepadinum Q**SU942 852****Species of Interest***Chaenotheca stemonea* Q*Chaenothecopsis nigra* LQ*Microcalicium ahlneri* LQ*Thelotrema lepadinum* Q**SU9485****BUB053** (SU94391 85345, 71m): broken ancient Beech hollow pollard by path. Tag 01086*Bellicidia incompta* LFg F Inside hollow*Pyrenula nitidella* Fg F K + P perithecia

Also

Dendrographa decolorans Fg*Opegrapha atra* Fg*Pertusaria hymenea* Fg

Photos 2020-06-09-32 – 34

A2.6 New Coppice, SU9485

Walked back through New Coppice, no colonisation by old woodland lichens seen. Some was overgrown coppice but other areas were high forest with post mature trees, which would be suitable for colonisation by more mobile woodland lichens in clean air situations.

A3 Burnham Beeches 22/6/2020**A3.1 Weather**

Dry and sunny.

A3.2 Higher on Main Valley Slopes Above Burnham Walk

The eastern continuation of the Victoria Drive Valley & Mendelssohn's Slope site, working along the road

SU9585**SU952 850**

Some ancient Beech, including one tree of high interest

SU951 850**BUB054** (SU95172 85084, 76m): first recorded 21/9/18, ancient Beech pollard just below road. Tag 01370

Recorded 21/9/18:

<i>Pachyphiale carneola</i>	Fg	
<i>Thelopsis rubella</i>	Fg	F

Also

<i>Enterographa crassa</i>	Fg	
<i>Thelotrema lepadinum</i>	Fg	

Recorded 22/6/20:

<i>Porina borrieri</i>	Fg	
<i>Dendrographa decolorans</i>	Fg	
<i>Pertusaria hymenea</i>	Fg	

Photo 2020-06-22-01

SU952 850

Further old Beech, but less interest

SU952 850**Species of Interest**

<i>Enterographa crassa</i>	Fg	SU9520 8509
<i>Porina borrieri</i>	Fg	SU9520 8509

Other Species

<i>Graphis scripta</i>	Fg	
<i>Opegrapha vermicellifera</i>	Fg	

SU950 850**Species of Interest**

<i>Chaenotheca trichialis</i>	Q	SU9505 8505 ancient Oak pollard
<i>Porina byssophila</i>	Fg	
<i>Strigula taylorii</i>	Fg	

A3.3 Driftway Between New Coppice and Fleet Wood SU9485

Worked the pasture woodland between the former coppices. There are few old trees, and these are too shaded lower down. There are more veteran trees these are and better lit higher up. The latter are included in the Crabtree Heath area.

SU9485**SU949 852**

BUB055 (SU94961 85214, 70m): post mature maiden *Quercus x rosacea* by road

<i>Chaenotheca stemonea</i>	Q	O	
<i>Micarea doliiformis</i>	Q	R	New to central England

Also

<i>Chaenotheca trichialis</i>	Q	
<i>Cliostomum griffithii</i>	Q	
<i>Dendrographa decolorans</i>	Q	

Photo 2020-06-22-02

BUB056 (SU94946 85238, 63m): twisted post mature Oak maiden

<i>Chaenothecopsis nigra</i>	Q	R	Spores 1 septate, with septa darker than the cell walls
<i>Microcalicium ahlneri</i>	Q	R	

SU949 852**Species of Interest**

<i>Chaenotheca stemonea</i>	Q	
<i>Chaenotheca trichialis</i>	Q	
<i>Chaenothecopsis nigra</i>	Q	
<i>Enterographa crassa</i>	Fg	SU9491 8528
<i>Micarea doliiformis</i>	Q	
<i>Microcalicium ahlneri</i>	Q	
<i>Porina borneri</i>	Fg	SU9491 8528
<i>Porina byssophila</i>	Fg	
<i>Pyrenula chlorospila</i>	Fg	SU9491 8528
<i>Strigula taylorii</i>	Fg	

Other Species

<i>Agonimia tristicula</i>	Fg
<i>Cliostomum griffithii</i>	Q
<i>Dendrographa decolorans</i>	Q
<i>Diarthonis spadicea</i>	Q
<i>Lecanactis abietina</i>	Q

SU949 853

BUB057 (SU94922 85329, 67m): mature Holly by road

<i>Stenocybe septata</i>	lx	F
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A3.4 Crabtree Heath SU9485

Working anti-clockwise around the pasture woodland, patchy interest including on Oak, alive and standing dead and areas of rich Beech, but also large areas limited interest.

SU948 853**Other Species**

<i>Diarthonis spadicea</i>	Q
<i>Graphis elegans</i>	Fg
<i>Lecanactis abietina</i>	Q
<i>Lecanora expallens</i>	Fg
<i>Ochrolechia microstictoides</i>	Q

SU949 854

A lot of post mature Beech and hybrid Oak, poor lichen coverage on top, scattered ancient Beech and Oak pollards, many dead. Local high interest

BUB058 (SU94861 85523, 75m) (DL tree): ancient Hybrid Oak pollard by heathy glade, all interest refound on 22/6/2020. Tag 01054

<i>Bellicidia incompta</i>	Q	O
<i>Coenogonium tavaresianum</i>	Q	R
<i>Cresponea premnea</i>	Q	F

Also

<i>Amandinea punctata</i>	Q	Coll.
<i>Chaenotheca trichialis</i>	Q	
<i>Chrysothrix candelaris</i>	Q	
<i>Cliostomum griffithii</i>	Q	
<i>Enterographa crassa</i>	Q	
<i>Pertusaria flavida</i>	Q	
<i>Pertusaria hymenea</i>	Q	
<i>Porina byssophila</i>	Q	
<i>Pyrrhospora quernea</i>	Q	

Photo 2020-06-22-03

BUB060 (SU94982 85462, 72m): mature Holly

<i>Stenocybe septata</i>	lx	F	On four stems
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Also

<i>Diarthonis spadicea</i>	lx		
<i>Dimerella pineti</i>	lx		
<i>Graphis elegans</i>	lx		
<i>Porina leptalea</i>	lx		Morph with dull orange perithecia

SU949 854**Species of Interest**

<i>Bellicidia incompta</i>	Q
<i>Coenogonium tavaresianum</i>	Q

<i>Cresponea premnea</i>	Q
<i>Chaenotheca trichialis</i>	Q
<i>Enterographa crassa</i>	Q
<i>Pertusaria hymenea</i>	Q
<i>Porina byssophila</i>	Q
Other Species	
<i>Amandinea punctata</i>	Q
<i>Diarthonis spadicea</i>	lx
<i>Dimerella pineti</i>	lx
<i>Graphis elegans</i>	lx
<i>Porina leptalea</i>	lx
<i>Pyrrhospora quernea</i>	Q
<i>Pertusaria flavida</i>	Q
<i>Chrysothrix candelaris</i>	Q
<i>Cliostomum griffithii</i>	Q

SU948 855

BUB059 (SU94821 85556, 78m) (DL tree): standing dead Oak with some bark left attached

<i>Chaenotheca stemonea</i>	Q	O	
<i>Chaenothecopsis nigra</i>	LQ	F	Coll. Spores 1 septate, with septa darker than the cell walls
<i>Microcalicium ahlneri</i>	LQ	O	

Also

Cladonia polydactyla var. *polydactyla*LQ

Photo 2020-06-22-04

SU949 855

Some old Beech pollards, on one of which D. Lamacraft found *Dactylospora parasitica* parasitising *Pertusaria hymenea* on 03/04/2019, which was not refound during this survey on this tree. A mature Oak in the adjacent former coppice of Fleet Wood had *Thelotrema lepadinum*, a rare example of colonisation on to younger trees and into the former coppice.

SU949 855

DL 03/04/2019

Species of Interest

<i>Dactylospora parasitica</i>	Fg, Z1076	SU9493 8556
22/6/2020		
<i>Enterographa crassa</i>	Fg	SU9493 8556, SU9497 8554
<i>Thelotrema lepadinum</i>	Fg, Q	SU9493 8556, SU9497 8557 Mature Oak in former coppice Fleet Wood, colonising?

Other Species

<i>Dendrographa decolorans</i>	Fg	
<i>Graphis scripta</i>	Fg	
<i>Lecanora argentata</i>	Fg	SU9493 8556

<i>Lecanora expallens</i>	Fg
<i>Opegrapha vermicellifera</i>	Fg
<i>Opegrapha vulgata</i>	Fg
<i>Pertusaria hymenea</i>	Fg
<i>Pertusaria pertusa</i>	Fg

SU947 855

Some old Beech, limited interest

SU947 855**Species of Interest**

<i>Enterographa crassa</i>	Fg	SU9476 8551, SU9478 8552
<i>Porina byssophila</i>	Fg	SU9476 8551, SU9478 8552

Other Species

<i>Graphis scripta</i>	Fg
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SU947 856**Species of Interest**

<i>Porina byssophila</i>	Fg
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SU946 856

An area of greater interest around the moat, with rich Beeches and some dead Oaks

BUB061 (SU94611 85672, 66m): dead Oak stool base within the moat

<i>Cladonia incrassata</i>	LQ	A
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Also

<i>Cladonia coniocraea</i>	LQ	
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>	LQ	
<i>Parmeliopsis ambigua</i>	LQ	
<i>Trapeliopsis flexuosa</i>	LQ	fr.

Photo 2020-06-22-05**BUB064** (SU94654 85687, 81m): hollow Beech pollard. Tag 01026

<i>Bellicidia incompta</i>	LFg	O	Inside pollard
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Photo 2020-06-22-07**SU946 856****Species of Interest**

<i>Bellicidia incompta</i>	LFg	
<i>Cladonia incrassata</i>	LQ	
<i>Enterographa crassa</i>	Fg	SU9465 8564, SU9466 8564, SU9465 8568
<i>Thelotrema lepadinum</i>	Fg	SU9465 8568

Other Species

<i>Cladonia coniocraea</i>	LQ
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>	LQ
<i>Parmeliopsis ambigua</i>	LQ

<i>Trapeliopsis flexuosa</i>	LQ	fr.
<i>Dendrographa decolorans</i>	Fg	
<i>Opegrapha vermicellifera</i>	Fg	
<i>Graphis elegans</i>	Sba	

SU945 856

The bank of the Moat has some acid soil interest locally

BUB063 (SU94592 85694, 75m): ancient Beech inside moat

<i>Rinodina roboris</i> var. <i>roboris</i>	Fg	F
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Also

<i>Enterographa crassa</i>	Fg	
<i>Lecanora argentata</i>	Fg	
<i>Opegrapha varia</i>	Fg	Coll.

SU9458 8568 Acid soil

Species of Interest

<i>Cladonia caespiticia</i>	Terr	fr.	On moat bank
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Other Species

<i>Cladonia coniocraea</i>	Terr	
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>	Terr	
<i>Lichenomphalia umbellifera</i>	Terr	

SU946 857

BUB062 (SU94610 85707, 72m): ancient twisted Beech inside moat

<i>Pertusaria pustulata</i>	Fg	R	Coll.	Two thalli. Herb. Sanderson 2762. Thallus C + Y; asci with two spores; spores 80 – 100 x 30 – 35µm
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Also

<i>Arthonia radiata</i>	Fg	
<i>Caloplaca obscurella</i>	Fg	
<i>Enterographa crassa</i>	Fg	
<i>Pertusaria hymenea</i>	Fg	
<i>Pertusaria pertusa</i>	Fg	
<i>Porina byssophila</i>	Fg	

Photo 2020-06-22-06

SU945 857

The bank of the Moat has some further acid soil interest here as well

SU9458 8570 moat bank, where shaded by Beech tree

Species of Interest

<i>Trapeliopsis gelatinosa</i>	C –	New to central England
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SU945 856

The outer moat bank had some minor development of heathland lichens

SU945 856**Species of Interest***Strigula taylorii* Fg SU9453 8568**Other Species***Cladonia cryptochlorophaea* Terr*Cladonia digitata* Terr*Cladonia polydactyla* var. *polydactyla* Terr*Cladonia ramulosa* Terr*Lichenomphalia umbellifera* Terr*Trapeliopsis pseudogranulosa* Terr**SU944 857****BUB065** (SU94482 85743, 78m): standing dead Oak on moat outer boundary bank*Microcalicium ahlneri* LQ R**SU944 856****Species of Interest***Enterographa crassa* Fg SU9444 8561**Southern part of Crabtree Heath**

This area has a major concentration of rich Beech and some live and standing dead Oaks.

SU944 854**BUB066** (SU94414 85490, 74m): standing dead Oak in glade*Microcalicium ahlneri* LQ O*Chaenothecopsis nigra* LQ R Coll. Spores 1 septate, with septa darker than the cell walls**SU944 854****BUB067** (SU94452 85452, 76m): ancient hollow Beech*Pyrenula nitida* Fg O Streak between the upper blue pins and another thallus below. Pink pins colonising thalli perithecia K + P

Also

Enterographa crassa Fg*Opegrapha atra* Fg*Opegrapha vermicellifera* Fg*Porina byssophila* Fg**Photos** 2020-06-22-08 & 9**BUB069** (SU94475 85453, 70m): standing dead Oak by path

<i>Chaenothecopsis nigra</i>	LQ	O	Coll. Spores 1 septate, with septa darker than the cell walls
<i>Microcalicium ahlneri</i>	LQ	F	

BUB071 (SU94475 85473, 66m): ancient Oak pollard by glade. Tag 01071

<i>Chaenotheca hispidula</i>	Q	R	
<i>Chaenotheca stemonea</i>	Q	O	Sterile

SU944 854

Species of Interest

<i>Chaenotheca hispidula</i>	Q		
<i>Chaenotheca stemonea</i>	Q		
<i>Chaenothecopsis nigra</i>	LQ		
<i>Enterographa crassa</i>	Fg		
<i>Microcalicium ahlneri</i>	LQ		
<i>Porina byssophila</i>	Fg		
<i>Pyrenula nitida</i>	Fg		

Other Species

<i>Opegrapha atra</i>	Fg		
<i>Opegrapha ochrocheila</i>	LFg		
<i>Opegrapha vermicellifera</i>	Fg		

SU944 853

BUB068 (SU94438 85383, 75m): open hollow Beech pollard, supported by an A frame. Tag 01077

<i>Bellicidia incompta</i>	LFg	O	Inside hollow
<i>Zygodon forsteri</i>	LFg	O	Mostly protonema

SU944853

Species of Interest

<i>Bellicidia incompta</i>	LFg		
<i>Chaenotheca brunneola</i>	LQ	SU9445 8537	Standing dead smaller Oak, thallus Pd + O (BUB104)
<i>Coniocarpon cinnabarinum</i>	Fg	SU9442 8538	
<i>Enterographa crassa</i>	Fg	SU9446 8536, SU9442 8538	
<i>Porina byssophila</i>	Fg	SU9446 8536	
<i>Strigula taylorii</i>	Fg	SU9446 8536	

Bryophytes

<i>Zygodon forsteri</i>	LFg		
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SU945 854

BUB070 (SU94500 85437, 70m): ancient Beech pollard by glade. Tag 01072 & 3

<i>Pyrenula nitida</i>	Fg	O	About 5 thalli
Also			
<i>Enterographa crassa</i>	Fg		

Photos 2020-06-22-10 & 11**BUB072** (SU94512 85484, 68m): standing dead Oak pollard

<i>Chaenothecopsis nigra</i>	R	Coll. Spores 1 septate, with septa darker than the cell walls
<i>Microcalicium ahlneri</i>	LQ	O

SU945 854**Species of Interest**

<i>Chaenothecopsis nigra</i>	LQ
<i>Enterographa crassa</i>	Fg
<i>Microcalicium ahlneri</i>	LQ
<i>Pyrenula nitida</i>	Fg

SU945 855

Some Beech pollards

SU945 855

<i>Enterographa crassa</i>	Fg	SU9450 8550, SU9455 8552
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SU945 854**BUB075** (SU94523 85431, 73m): open hollow Beech pollard. Tag 01102

<i>Bellicidia incompta</i>	LFg	Inside hollow trunk
Also		
<i>Enterographa crassa</i>	Fg	

BUB076 (SU94525 85445, 76m): smaller ancient Beech pollard. Tag 01103.

<i>Pyrenula nitidella</i>	Fg	F	Steak if mature thalli, with colonisation into former wound track at one place. Perithecium K + P
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Also

<i>Enterographa crassa</i>	Fg
<i>Porina byssophila</i>	Fg

Photos 2020-06-22-12 & 13**SU945 854****Species of Interest**

<i>Bellicidia incompta</i>	LFg	
<i>Enterographa crassa</i>	Fg	SU9459 8543, SU9454 8541
<i>Porina byssophila</i>	Fg	SU9454 8541
<i>Pyrenula nitidella</i>	Fg	
<i>Thelotrema lepadinum</i>	Fg	SU9459 8543

SU944 856**BUB073** (SU94608 85435, 68m): ancient Beech pollard. Tag 01108

<i>Opegrapha corticola</i>	Fg	A
<i>Thelopsis rubella</i>	Fg	R
Also		
<i>Bacidina phacodes</i>	Fg	
<i>Dactylospora parasitica</i>	Fg, Z1076	
<i>Dendrographa decolorans</i>	Fg	
<i>Enterographa crassa</i>		
<i>Pachnolepia pruinata</i>	Fg	
<i>Pertusaria hymenea</i>	Fg	
<i>Porina borrieri</i>	Fg	

BUB074 (SU94612 85434, 70m): standing dead Oak by path

<i>Chaenothecopsis nigra</i>	LQ	O	Coll. Spores 1 septate, with septa darker than the cell walls
<i>Microcalicium ahlneri</i>	LQ	O	

SU946 854**Species of Interest**

<i>Bacidina phacodes</i>	Fg	
<i>Chaenothecopsis nigra</i>	LQ	
<i>Dactylospora parasitica</i>	Fg, Z1076	
<i>Dendrographa decolorans</i>	Fg	
<i>Enterographa crassa</i>	Fg	SU9462 8548
<i>Microcalicium ahlneri</i>	LQ	
<i>Opegrapha corticola</i>	Fg	
<i>Pachnolepia pruinata</i>	Fg	SU9462 8548
<i>Porina borrieri</i>	Fg	
<i>Thelopsis rubella</i>	Fg	
Other Species		
<i>Pertusaria hymenea</i>	Fg	

SU947 854**BUB077** (SU94722 85427, 72m): ancient Beech pollard by Woods Drive. Tag

<i>Sporodophoron cretaceum</i>	Fg	R
Also		
<i>Enterographa crassa</i>	Fg	
<i>Porina byssophila</i>	Fg	
<i>Thelotrema lepadinum</i>	Fg	

A3.5 Fleet Wood SU9585

Walked along Dukes Drive through the former coppice. Dominated by dense Beech high forest with a lot of post mature Beech but widespread dense young Holly.

A3.6 Egypt Woods SU9585

A brief transect through the woods here. A trawl through suggested lichen cover appears is mainly poor compared to the other areas. However, some interest was spotted, so clearly worth a better look.

SU955 856

BUB078 (SU95566 85609, 75m) (First recorded 3/4/2019, DL): a dead standing Oak, the *Chaenothecopsis nigra* was not refound in 2020.

Chaenothecopsis nigra LQ 3/4/2019

Microcalicium ahlneri LQ O

Also

Cladonia diversa

Cladonia parasitica LQ

Cladonia polydactyla var. *polydactyla* LQ

Clypeococcum hypocenomycis LQ, Z0578

Hypocenomyce scalaris LQ

Adjacent Beech:

Enterographa crassa Fg

Thelotrema lepadinum Fg

Photo 2020-07-07-20 *Microcalicium ahlneri* close up

SU955 856**Species of Interest**

Chaenotheca trichialis Q

Chaenothecopsis nigra LQ

Cladonia parasitica LQ

Enterographa crassa Fg

Microcalicium ahlneri LQ

Thelotrema lepadinum Fg

Other Species

Cladonia diversa

Cladonia parasitica LQ

Cladonia polydactyla var. *polydactyla* LQ

Clypeococcum hypocenomycis LQ, Z0578

Hypocenomyce scalaris LQ

SU956 853**Species of Interest**

Enterographa crassa Fg SU9563 8532

A4 Burnham Beeches 7/7/2020**A4.1 Weather**

Dry and sunny.

A4.2 Lower on Main Valley Slopes by Burnham Walk SU9585**SU9585****SU952 851**

As noted in 21/9/2018, there is some spread on to younger trees at this point in this valley

BUB079 (SU95230 85154, 64m) (first noted 21/9/2018): dead Beech pollard with all branches broken*Sporodophoron cretaceum* Fg R

Also

Enterographa crassa Fg*Thelotrema lepadinum* Fg**SU952 851****Species of Interest***Enterographa crassa* Fg SU9524 8516*Porina byssophila* Co*Strigula taylorii* Co, Fg*Thelotrema lepadinum* Fg, Q SU9521 8519 Mature Oak**Other species***Cladonia polydactyla* var. *polydactyla* LQ*Dendrographa decolorans* Q*Graphis scripta* Co*Jamesiella anastomosans* LQ*Trapeliopsis pseudogranulosa* Q**SU951 851**

This area has significant colonisation by the more mobile wood woodland lichen species on to the mature and younger post mature tree

BUB081 (SU 95131 85145, 59m): a big maiden mature Beech*Mycoporum antecellens* Fg

Also

Graphis scripta Fg**Photo** 2020-07-07-01**SU951 851****Species of Interest***Coniocarpon cinnabarinum* Fg SU9510 8513

<i>Enterographa crassa</i>	Fg, Q	SU9514 8511, SU9510 8513, SU9516 8514, SU9516 8517, SU9517 8516 mature Sessile Oak & suppressed young Beech
<i>Mycoporum antecellens</i>	Fg	
<i>Porina borrieri</i>	Fg	SU9514 8511 post mature maiden Beech & SU9510 8513
<i>Thelotrema lepadinum</i>	Q, Fg	SU9518 8515 Mature Oak, SU9519 8510, younger post mature Oak, SU9514 8511 post mature maiden Beech & Mature Oak, SU9517 8516 mature Sessile Oak.

Other Species

<i>Arthonia radiata</i>	Sb	
<i>Graphis scripta</i>	Sb, Fg	
<i>Lecanactis abietina</i>	Q	
<i>Opegrapha atra</i>	Sb	

SU951 850**SU951 850****Species of Interest**

<i>Enterographa crassa</i>	Fg	SU9513 8509, SU9510 8510
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SU950 850

BUB080 (SU95044 85077, 60m): first recorded 21/09/18, a large dead Beech pollard, the original *Pyrenula nitida* tree

Bellicidia incompta	Fg	O
Pyrenula nitida	Fg	A
Thelopsis rubella	Fg	R

SU950 851

The area adjacent to the original *Pyrenula nitida* tree, includes two probable colonisations of *Pyrenula nitida* on to smaller slow growing suppressed Beech trees. The general lichen assemblage of younger Beeches, on to which material from BUB080 was translocated, was recorded as well in 2/4/2019. A colonised mature Oak was noted during the recent survey

BUB008 (SU95048 85101, 31m), recorded 2/4/2019, suppressed Beech with three colonising *Pyrenula*, which looked like *Pyrenula nitida* (but were too small to damage by testing with K). Tagged 04055.

<i>Pyrenula nitida</i>	Fg	Colonisation by 3 sterile thalli
Also		
<i>Diarthonis spadicea</i>	Fg	
<i>Enterographa crassa</i>	Fg	
<i>Graphis scripta</i>	Fg	
<i>Porina borrieri</i>	Fg	
<i>Porina byssophila</i>	Fg	

BUB009 (SU95057 85106, 35m), recorded 2/4/2019, a leaning slow growing suppressed Beech 12 colonising *Pyrenula* thalli, mostly sterile, but one with a mature perithecia, which looked like *Pyrenula nitida* (but was too small to damage by testing with K). Tagged 04056.

<i>Pyrenula nitida</i>	Fg	Colonisation by 12 thalli
Noted on tree		
<i>Diarthonis spadicea</i>	Fg	
<i>Enterographa crassa</i>	Fg	
<i>Graphis scripta</i>	Fg	
<i>Porina leptalea</i>	Fg	

SU950 851

Species of interest

Recorded 2020

<i>Enterographa crassa</i>	Q, Fg	SU9507 8512 mature Oak
<i>Porina borrieri</i>	Fg	SU9507 8512 younger
<i>Thelotrema lepadinum</i>	Q	SU9507 8512 mature Oak

Recorded 2/4/2019

<i>Porina byssophila</i>	Fg	
<i>Pyrenula nitida</i>	Fg	

Other Species

<i>Anisomeridium polypori</i>	Fg	
<i>Cliostomum griffithii</i>	Fg	
<i>Diarthonis spadicea</i>	Fg	
<i>Graphis scripta</i>	Fg	
<i>Lepraria finkii</i>	Fg	
<i>Pertusaria hymenea</i>	Fg	
<i>Porina aenea</i>	Fg	
<i>Porina leptalea</i>	Fg	
<i>Psoroglaena stigonemoides</i>	Fg	

SU952 852

Further examples of colonisation onto younger trees, including maiden post mature Beech and Hazel on edges of pasture woodland beside former coppice, but nothing of interest had crossed over the bank in to Fleet Wood.

SU952 852

Species of Interest

<i>Enterographa crassa</i>	Fg, Co	SU9526 8522 maiden post mature Beech, SU9526 8524 Hazel
<i>Porina byssophila</i>	Co	SU9526 8524

A4.3 The Nile SU9585

The Nile, the upper valley, represents a gap in the lichen interest between the Victoria Drive Valley & Mendelssohn's Slope area and Egypt Woods. Here the woodland is dense high forest with no ancient trees to and only rare post mature Oak and Beech.

The only significant interest seen was on a dead Pine in recent bog woodland, which was closer to the Egypt Woods area of interest.

SU953 852**Species of interest**

<i>Porina byssophila</i>	Fg	
<i>Strigula taylorii</i>	Fg	
<i>Thelotrema lepadinum</i>	Q	SU9536 8520 suppressed young Oak

SU955 851

BUB082 (SU95510 85176, 62m): standing dead Scots Pine in bog woodland

Microcalicium ahlneri LPs O

Photo 2020-07-07-0

SU955 851**Species of interest**

<i>Microcalicium ahlneri</i>	LPs
<i>Strigula taylorii</i>	Fg

A4.4 Egypt Woods SU9585

Interest is more scattered than in the Victoria Drive Valley – Mendelssohn's Slope area and flushed base rich bark species on old Beech are much rarer, but wound track and lignum assemblages are significant.

SU956 853

BUB083 (SU95648 85305, 66m): standing dead Oak pollard in shade

Microcalicium ahlneri LQ R

SU956 853**Species of interest**

<i>Enterographa crassa</i>	Fg	SU9563 8531
<i>Microcalicium ahlneri</i>	LQ	

Other Species

<i>Opegrapha vermicellifera</i>	Fg
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SU955 852

BUB084 (SU95575 85253, 60m): ancient maiden Beech

Zygodon forsteri LFg R A clump in root knot hole

Also on trunk

<i>Enterographa crassa</i>	Fg
<i>Dendrographa decolorans</i>	Fg
<i>Opegrapha vermicellifera</i>	Fg

Photos 2020-07-07-03 – 5

BUB085 (SU95544 85294, 66m): ancient hollow Beech pollard. Tag 01525

Zygodon forsteri Fg R On boss on root

Trunk

Opegrapha corticola Fg R

Inside trunk

Bellicidia incompta LFg F Sterile

Also

Enterographa crassa Fg

Pyrenula chlorospila Fg

Photos 2020-07-07-06 – 9

SU955 852

Species of interest

Bellicidia incompta LFg

Enterographa crassa Fg

Opegrapha corticola Fg

Pyrenula chlorospila Fg

Zygodon forsteri LFg

Other Species

Lichenomphalia umbellifera LFg

Dendrographa decolorans Fg

Opegrapha vermicellifera Fg

SU955 853

Beech lichen diversity declining up hill

SU955 853

Species of interest

Enterographa crassa Fg SU9557 8535, SU9552 8537, SU9551 8537

Other Species

Dendrographa decolorans Fg

Graphis scripta Fg

Opegrapha atra Fg

Opegrapha vulgata Fg

Pertusaria hymenea Fg

SU9654 853

SU954 853

Species of interest

Enterographa crassa Fg SU9548 8537

SU955 854

Area with a concentration of interest.

BUB086 (SU95516 85406, 74m): ancient Oak pollard in open area

Chaenotheca chrysocephala Q R
Chaenotheca stemonea Q R
 Also
Chaenotheca trichialis Q
 Photo 2020-07-07-10

BUB087 (SU95518 85425, 74m): ancient Beech pollard in open area

Bellicidia incompta LFg F Inside hollow trunk, not easily accessible but fertile near opening

Zygodon forsteri Fg Three tufts a root knothole eastern side, three tufts west side plus one more tuft in third knothole

BUB089 (SU95563 85447, 74m): standing dead Oak in open area

Microcalicium ahlneri LQ R

BUB090 (SU95548 85438, 75m): standing dead Oak in open area

Microcalicium ahlneri LQ O

SU955 854

Species of interest

Bellicidia incompta LFg

Chaenotheca chrysocephala Q

Chaenotheca stemonea Q

Chaenotheca trichialis Q

Microcalicium ahlneri LQ

Strigula taylorii Fg

Zygodon forsteri Fg

Other Species

Hypocenomyce scalaris Q

SU956 854

BUB088 (SU95633 85461, 74m): ancient Oak pollard in glade. Tag 01501

Chaenothecopsis nigra Q Coll. One septate spores with septa darker than the cell wall

SU956 854

Species of interest

Chaenothecopsis nigra Q

Thelotrema lepadinum Q SU9560 8546 ancient Oak pollard

SU954 854

Species of interest

Enterographa crassa Fg SU9549 8546, SU9549 8549

SU954 855

Species of interest

Enterographa crassa Fg SU9548 8550, SU9549 8551

SU955 855

BUB091 (SU95563 85581, 70m): ancient Sessile Oak pollard in open area. Tag 01453

Chaenotheca stemonea Q O Sterile Pd/UV + Y

SU955 855**Species of interest**

Chaenotheca stemonea Q

Enterographa crassa Fg SU9551 8552, SU9551 8557

Other Species

Opegrapha vermicellifera Fg

SU956 855

BUB092 (SU95608 85504, 70m): standing dead Oak deeply shaded by Holly

Microcalicium ahlneri LQ R

BUB093 (SU95667 85547, 68m): twin trunk post mature Beech with water reservoir between the two trunks

Zygodon forsteri Fg O In grove draining reservoir, protomema dominant

BUB094 (SU95676 85543, 69m): standing dead Oak shaded by Holly

Microcalicium ahlneri LQ R

SU956 855**Species of interest**

Enterographa crassa Fg SU9561 8556

Microcalicium ahlneri LQ

Porina byssophila Fg

Zygodon forsteri Fg

SU957 855

BUB095 (SU95724 85597, 70m): mature Holly by glade

Stenocybe septata lx F

SU957 856

BUB096 (SU95710 85609, 69m): ancient Oak with much lignum exposed

Chaenothecopsis nigra LQ O Coll. One septate spores with septa darker than the cell wall

Microcalicium ahlneri LQ R

Also

Chrysothrix flavovirens Q
Cladonia digitata LQ
Cladonia polydactyla var. *polydactyla* LQ

SU956 856**Species of interest**

Chaenotheca trichialis QSU9563 8563 ancient Oak pollard
Cladonia parasitica LQ SU9569 863 fallen dead Oak

BUB078: photo of *Microcalicium ahlneri* (2020-07-07-20), see section A3.4

SU955 856

BUB097 (SU95567 85643, 70m): ancient Oak pollard

Chaenotheca chrysocephala Q R
Chaenotheca stemonea Q R Sterile Pd/UV + Y

BUB098 (SU95515 85662, 69m): standing dead Oak pollard in glade

Microcalicium ahlneri LQ O

SU956 857**Species of interest**

Enterographa crassa Fg SU9564 8571, SU9562 8572
Pyrenula chlorospila Fg SU9564 8571

SU957 857

BUB099 (SU95718 85722, 74m): standing dead Oak in glade

Microcalicium ahlneri LQ F
Chaenothecopsis nigra LQ R Coll. One septate spores with
 septa darker than the cell wall

BUB100 (SU95774 85793, 75m): ancient Beech pollard shaded by Holly

Zygodon forsteri Fg F In wound track

BUB101 (SU95708 85754, 73m): standing dead Oak, shaded by Holly

Microcalicium ahlneri LQ F

SU955 857

BUB102 (SU95579 85792, 67m): broken Pedunculate Oak pollard

Microcalicium ahlneri LQ R

SU955 857**Species of interest**

Chaenotheca trichialis Q SU9559 8576
Enterographa crassa Fg SU9555 8578

Microcalicium ahlneri LQ

SU956 858

BUB103 (SU95600 85823, 65m): ancient hollow Beech pollard

Sporodophoron cretaceum Fg R

Also

Dendrographa decolorans

Enterographa crassa

Opegrapha vermicellifera

SU956 857

Species of interest

Thelotrema lepadinum Q SU9561 8578

SU954 857

Species of interest

Enterographa crassa Fg SU9549 8571

Strigula taylorii Fg SU9549 8571

Other Species

Dendrographa decolorans Fg

SU954 856

Species of interest

Enterographa crassa Fg SU9546 8569

Other Species

Dendrographa decolorans Fg

SU953 856

Species of interest

Thelotrema lepadinum Q SU9539 8567 Maiden post mature Oak

A4.5 Fleet Wood SU9585

Went back through the former coppice of Fleet Wood. As previously noted this is now Oak – Beech high forest with mature going on post mature trees dominant but no colonisation by old woodland lichens found.

ANNEX 2 SPECIES LISTS**General Key****Species**

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

SOWI

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

PLI

1 = Species used to calculate the Pinhead Lichen Index

All

0 = Species only recorded 1923 – 2001

1 = Species recorded 2016 – 2020

Locations for 2020 Survey

ELMD = Valley east of Lord Mayors Dive

SWP = Seven Ways Plain

VVMS = Victoria Drive Valley & Mendelssohn's Slope

PH = Pumpkin Hill

CTH = Crabtree Heath

EW = Egypt Woods

Conservation Status

Ex = Regarded as Extinct in Britain by Woods & Coppins (2012), since rediscovered.

VU = Vulnerable Red Data Book species

NT = Near Threatened Red Data Book species

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

NR = Nationally Rare

NS = Nationally Scarce

IR = International Responsibility species

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

[NR] = Nationally Rare lichenicolous (fungal parasite of a lichen), likely to be very under recorded

Substrates

Co = Hazel, lx = Holly, Fg = Beech, Ps = Scots Pine, Q = Oak, Sba = Whitebeam, Sb = Rowan, L = Lignum (as prefix) & Tw = twigs & branches. T = Terricolous

Hosts for lichenicolous fungi

Z = Lichenicolous species, host not given, Z0533 = *Graphis scripta*, Z0578 = *Hypocenomyce scalaris*.

SPECIES LIST 1**Burnham Beeches, 1923 – 2020**

Species	2016	2018 – 20	All	SOWI	PHI	Conservation Status	New
<i>Acrocordia gemmata</i>			0				
<i>Agonimia flabelliformis</i>		1	1	1		Nb (NR)	VC

Species	2016	2018 – 20	All	SOWI	PHI	Conservation Status	New
Agonimia tristicula		1	1				
Amandinea punctata	1	1	1				
Anisomeridium polypori		1	1				
Anisomeridium ranunculosporum		1	1	1			VC
Athelia arachnoidea			0				
Arthonia didyma	1		1				
Arthonia punctiformis	1		1				
Arthonia radiata	1	1	1				
Arthopyrenia analepta	1		1				
Arthopyrenia punctiformis	1		1				
Bacidia friesiana			0			Nb (NS)	
Bacidia neosquamulosa	1		1				
Bacidina adastrata		1	1				VC
Bacidina phacodes		1	1				
Baeomyces rufus			0				
Bellicidia incompta	LFg	1	1			VU (NS/S41)	
Brianaria bauschiana			0				
Buellia griseovirens	1	1	1				
Calicium glaucellum		1	1		1		
Calicium salicinum			0		1		
Calicium viride			0		1		
Caloplaca obscurella		1	1				
Candelaria concolor	1		1				
Candelariella vitellina f. vitellina	1		1				
Candelariella xanthostigmoides	1	1	1				
Catillaria nigroclavata	1		1			(NS)	
Chaenotheca brachypoda		1	1		1		
Chaenotheca brunneola		1	1	1	1		VC
Chaenotheca chrysocephala		1	1	1	1		
Chaenotheca ferruginea	1	1	1		1		
Chaenotheca hispidula	1	1	1	1	1	Nb (NS)	
Chaenotheca stemonea	1	1	1	1	1	Nb (NS)	
Chaenotheca trichialis	1	1	1	1	1		
Chaenothecopsis nigra	1	1	1		1	Nb (NS)	
Chaenothecopsis pusilla			0		1	Nb (NS)	
Chrysothrix candelaris		1	1				
Chrysothrix flavovirens	1	1	1				
Cladonia caespiticia		1	1	1			VC
Cladonia coniocraea	1	1	1				
Cladonia cryptochlorophaea		1	1				VC
Cladonia digitata		1	1				
Cladonia diversa		1	1				VC
Cladonia fimbriata	1	1	1				
Cladonia floerkeana			0				
Cladonia furcata			0				
Cladonia incrassata		1	1			Nb (NS)	VC
Cladonia macilentata		1	1				
Cladonia parasitica	1	1	1	1			

Species	2016	2018 – 20	All	SOWI	PHI	Conservation Status	New
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>		1	1				
<i>Cladonia portentosa</i>			0				
<i>Cladonia ramulosa</i>		1	1				
<i>Cliostomum griffithii</i>	1	1	1				
<i>Clypeococcum hypocenomycis</i>	1	1	1				
<i>Coenogonium tavaresianum</i>		1	1			Nb (NR)	VC
<i>Coniocarpon cinnabarinum</i>	Fg	1	1				
<i>Cresponea premnea</i>		1	1	1		Nb (IR)	
<i>Dactylospora parasitica</i>		1	1			[NS]	
<i>Dendrographa decolorans</i>	1	1	1				
<i>Diarthonia spadicea</i>	1	1	1				
<i>Dimerella pineti</i>	1	1	1				
<i>Diploicia canescens</i>			0				
<i>Enterographa crassa</i>	1	1	1				
<i>Erythricium aurantiacum</i>	Z		1				
<i>Evernia prunastri</i>	1	1	1				
<i>Flavoparmelia caperata</i>	1	1	1				
<i>Flavoparmelia sooredians</i>	1		1				
<i>Fuscidea lightfootii</i>	1	1	1				
<i>Graphis elegans</i>		1	1				
<i>Graphis scripta</i>	1	1	1				
<i>Gyalecta truncigena</i>		1	1				
<i>Halecania viridescens</i>	1		1			(NS)	
<i>Hyperphyscia adglutinata</i>	1		1				
<i>Hypocenomyce scalaris</i>	1	1	1				
<i>Hypogymnia physodes</i>	1		1				
<i>Hypogymnia tubulosa</i>			0				
<i>Hypotrachyna afrorevoluta</i>	1	1	1				
<i>Hypotrachyna revoluta</i> s. str.	1		1				
<i>Jamesiella anastomosans</i>		1	1				
<i>Laetisaria lichenicola</i>	Z		1				
<i>Lecanactis abietina</i>	1	1	1				
<i>Lecanora argentata</i>		1	1			(NS)	VC
<i>Lecanora barkmaniana</i>	1		1			(NS)	
<i>Lecanora chlarotera</i>	1	1	1				
<i>Lecanora conizaeoides</i> f. <i>conizaeoides</i>			0				
<i>Lecanora expallens</i>	1	1	1				
<i>Lecanora jamesii</i>		1	1	1			VC
<i>Lecanora pulicaris</i>	1		1				
<i>Lecanora symmicta</i>	1	1	1				
<i>Lecidea nylanderii</i>	Q	1	1			Nb (NS)	
<i>Lecidella elaeochroma</i> f. <i>elaeochroma</i>	1	1	1				
<i>Lepraria finkii</i>	1	1	1				
<i>Lepraria incana</i> s. str.	1		1				
<i>Lichenomphalia umbellifera</i>		1	1				VC
<i>Loxospora elatina</i>		1	1	1			
<i>Melanelixia glabrata</i>		1	1				
<i>Melanelixia subaurifera</i>	1	1	1				

Species	2016	2018 – 20	All	SOWI	PHI	Conservation Status	New
Micarea doliiformis		1	1			Nb (NS)	VC
Micarea prasina s. lat.		1	1				
Micarea viridileprosa		1	1			(NS)	VC
Microcalicium ahlneri	LQ	1	1		1	Nb (NS)	
Mycoporum antecellens		1	1	1			VC
Normandina acroglypta		1	1				VC
Normandina pulchella		1	1				
Ochrolechia androgyna			0				
Ochrolechia microstictoides		1	1				
Ochrolechia subviridis			0				
Opegrapha atra	1	1	1				
Opegrapha corticola		1	1	1		Nb (IR)	VC
Opegrapha ochrocheila	1	1	1				
Opegrapha soreidiifera		1	1				
Opegrapha varia		1	1				
Opegrapha vermicellifera	1	1	1				
Opegrapha vulgata	1	1	1				
Pachnolepia pruinata		1	1				
Pachyphiale carneola		1	1	1			
Parmelia saxatilis s. lat.	1	1	1				
Parmelia sulcata	1	1	1				
Parmeliopsis ambigua	1	1	1				
Parmotrema perlatum	1	1	1				
Pertusaria amara f. amara			0				
Pertusaria coccodes			0				
Pertusaria flavida		1	1				
Pertusaria hymenea	1	1	1				
Pertusaria multipuncta			0	1			
Pertusaria pertusa	1	1	1				
Pertusaria pustulata		1	1			VU (NR)	
Phaeophyscia orbicularis	1		1				
Phlyctis argena	1	1	1				
Phylloblastia inexpectata	Flx		1			(NS)	
Physcia aipolia	1		1				
Physcia tenella	1	1	1				
Physconia enteroxantha	1		1				
Physconia grisea	1		1				
Physconia perisidiosa			0				
Placynthiella icmalea			0				
Platismatia glauca	1		1				
Porina aenea		1	1				
Porina borrieri	Fg	1	1			Nb (NS)	
Porina byssophilala	1	1	1			Nb (NS)	
Porina hibernica		1	1	1		NT (NS/IR/S41)	VC
Porina leptalea		1	1				
Porina multipuncta		1	1				VC
Pseudoschismatomma rufescens		1	1				
Psilolechia lucida		1	1				

Species	2016	2018 – 20	All	SOWI	PHI	Conservation Status	New
<i>Psoroglaena stigonemoides</i>		1	1				
<i>Punctelia jeckeri</i>	1		1				
<i>Pyrenula chlorospila</i>		1	1				
<i>Pyrenula nitida</i>		1	1			VU (NR/S41)	
<i>Pyrenula nitidella</i>		1	1			Ex (NR)	VC
<i>Pyrrhospora quereana</i>	1	1	1				
<i>Ramalina farinacea</i>	1	1	1				
<i>Rinodina roboris</i> var. <i>roboris</i>		1	1			Nb (IR)	
<i>Schizotrema quercicola</i>			0	1			
<i>Scoliciosporum pruinosum</i>		1	1				
<i>Scutula circumspecta</i>		1	1			VU (NS/S41)	VC
<i>Scytinium subtile</i>		1	1			Nb (NS)	VC
<i>Sporodophoron cretaceum</i>		1	1			Nb (IR)	VC
<i>Stenocybe septata</i>		1	1	1		Nb (IR)	
<i>Strigula taylorii</i>		1	1			Nb (NS/IR)	
<i>Syzygospora physciacearum</i>	Z		1			(NS)	
<i>Taeniolella punctata</i>		1	1				VC
<i>Thelopsis rubella</i>		1	1	1			VC
<i>Thelotrema lepadinum</i>	1	1	1	1			
<i>Trapeliopsis flexuosa</i>	1	1	1				
<i>Trapeliopsis gelatinosa</i>		1	1				VC
<i>Trapeliopsis pseudogranulosa</i>		1	1				
<i>Tubeufia heterodermiae</i>	Z		1				
<i>Unguiculariopsis thallophila</i>	Z		1			(NS)	
<i>Usnea subfloridana</i>			0				
<i>Varicellaria hemisphaerica</i>	1		1				
<i>Xanthoria parietina</i>	1	1	1				

Totals (Lichens)

Biodiversity Measure\Date	All	2016 – 20	2016	2018 – 20
Total taxa	174	151	85	121
Southern Oceanic Woodland Index score	21	19	6	19
Pinhead Lichen Index score	13	10	5	10
Extinct (recently re-found)	1	1	0	1
Vulnerable	4	4	1	4
Near Threatened	1	1	0	1
Notable	20	19	7	17
Nationally Rare	4	4	0	4
Nationally Scarce	20	18	8	17
International Responsibility Species	7	6	0	6
Section 41 species	4	4	1	4
TNTN score	40	37	11	37

Rejected Records

Name	Date & Recorder	Comment
<i>Bacidia arnoldiana</i>	1988 Recorder?	<i>Bacidina modesta</i> if on tree, but could be <i>Bacidia arnoldiana</i> on a building, unknown recorder.
<i>Buellia disciformis</i>	1988 Recorder?	Very unlikely record, would need a named recorder to accept
<i>Cladonia chlorophaea</i> s. lat.	1971 FR	Difficult to know what was meant but <i>Cladonia cryptochlorophaea</i> recorded 2020
<i>Cladonia pyxidata</i>	1923 Recorder?	Could be several species
<i>Lecania erysibe</i>	1988 Recorder?	From building, unknown recorder
<i>Lecidella stigmatia</i>	1988 Recorder?	From building, unknown recorder
<i>Opegrapha niveoatra</i>	1988 Recorder?	Critical species with no unknown recorder
<i>Trapeliopsis granulosa</i>	1971 FR	Aggregate record probably <i>Trapeliopsis flexuosa</i> , recorded in 2020.

SPECIES LIST 2
Burnham Beeches, 2018–2020

Species	EMD	SWP	WMS	PH	CIH	BW	SOM	PHI	Conservation Status
Lichens									
<i>Agonimia flabelliformis</i>			Fg	Q			1		Nb(NR)
<i>Agonimia tristicula</i>					Fg				
<i>Amandinea punctata</i>		Q			Q				
<i>Anisomeridium polypori</i>	Fg		Fg	Q					
<i>Anisomeridium ranunculosporum</i>				Q			1		
<i>Arthonia radiata</i>			Fg, Sb		Fg				
<i>Bacidina adastrata</i>	Fg								
<i>Bacidina phacodes</i>			Fg	Q	Fg				
<i>Bellicidia incompta</i>			LFg, Fg	LFg	LFg, Q	LFg			VU(NS/S41)
<i>Buellia griseovirens</i>	Fg								
<i>Calicium glaucellum</i>		LQ						1	
<i>Caloplaca obscurella</i>			Fg		Fg				
<i>Candelariella xanthostigmoides</i>			Fg						
<i>Chaenotheca brachypoda</i>			LFg	LFg				1	Nb(NS)
<i>Chaenotheca brumeola</i>		LQ			LQ		1	1	
<i>Chaenotheca chrysocephala</i>		Q				Q	1	1	
<i>Chaenotheca ferruginea</i>	Fg, Q	LQ			Q			1	
<i>Chaenotheca hispidula</i>			LFg		Q		1	1	Nb(NS)
<i>Chaenotheca stemonea</i>		Q		Q	Q	Q	1	1	Nb(NS)
<i>Chaenotheca trichialis</i>	Q	Q	Q	Q	Q	Q	1	1	
<i>Chaenothecopsis nigra</i>	LQ	LQ			LQ, Q	LQ, Q		1	Nb(NS)
<i>Chrysothrix candelaris</i>					Q				
<i>Chrysothrix flavovirens</i>		Q, LQ	Q			Q			
<i>Cladonia caespiticia</i>	T				T		1		
<i>Cladonia coniocraea</i>	LQ, Q	Q, LQ	LQ		LQ, T				
<i>Cladonia cryptochlorophaea</i>					T				
<i>Cladonia digitata</i>		Q, LQ	LQ		T	LQ			
<i>Cladonia diversa</i>						LQ			
<i>Cladonia fimbriata</i>		Q							
<i>Cladonia incrassata</i>	LQ				LQ				Nb(NS)
<i>Cladonia macilenta</i>			LQ						
<i>Cladonia parasitica</i>						LQ	1		
<i>Cladonia polydactyla</i> var. <i>polydactyla</i>	LQ	Q	LQ		LQ, T	LQ			
<i>Cladonia ramulosa</i>					T				
<i>Cliostomum griffithii</i>		Q	Fg	Q	Q				
<i>Clypeococcum hypocenomyces</i>						LQ, Z0578			
<i>Coenogonium tavaresianum</i>					Q				Nb(NR)
<i>Coniocarpon cinnabarinum</i>			Fg	Fg	Fg				
<i>Cresponia premnea</i>		Q	Q	Q	Q		1		Nb(IR)
<i>Dactylospora parasitica</i>					Fg, Z1076				[NS]
<i>Dendrographa decolorans</i>		Fg	Fg, Q	Q, Fg	Fg, Q	Fg			
<i>Diarthonia spadicea</i>	Q, lx		Fg		Q, lx				
<i>Dimerella pineti</i>	Fg				lx				
<i>Enterographa crassa</i>	Fg	Fg	Fg, Q, Co	Q, Fg	Q, Fg	Fg			
<i>Evernia prunastri</i>	Q, Tw, Q								
<i>Flavoparmelia caperata</i>	LQ, Q								
<i>Fuscidea lightfootii</i>	Q, Tw				Fg, lx, Sb				
<i>Graphis elegans</i>	Fg		Q						
<i>Graphis scripta</i>	Fg	Fg	Fg, Co, Sb	Fg	Fg	Fg			
<i>Gyalecta truncigena</i>			Fg						
<i>Hypocenomyce scalaris</i>		Q, LQ	LQ			LQ, Q			
<i>Hypotrachyna afrorevoluta</i>	Q, Tw								
<i>Jamesiella anastomosans</i>			LQ						
<i>Lecanactis abietina</i>	Q		Q		Q				
<i>Lecanora argentata</i>				Q	Fg				(NS)
<i>Lecanora chlorotera</i>		Q, LQ							
<i>Lecanora expallens</i>	Fg, Q	Fg	Fg		Fg				
<i>Lecanora jamesii</i>			Fg				1		
<i>Lecanora symmicta</i>	LQ								
<i>Lecidea rylanderi</i>		Q, LQ							Nb(NS)
<i>Lecidella elaeochroma</i> f. <i>elaeochroma</i>		Fg							
<i>Lepraria finkii</i>	Fg, Q		Fg						
<i>Lichenomphalia umbellifera</i>					T	LFg			
<i>Loxospora elatina</i>		Q	Q				1		
<i>Melanelixia glabrata</i>	LQ, Q								
<i>Melanelixia subaurifera</i>	Q, Tw								
<i>Micarea doliformis</i>		LQ			Q				Nb(NS)
<i>Micarea prasina</i> s. lat.	T								

Species	EIMD	SMP	WMS	PH	CTH	BW	SOM	PHI	Conservation Status
Micarea viridileprosa		Q							(NS)
Microcalicium ahleri	LQ	LQ			LQ,Q	LQ,LPS		1	Nb (NS)
Mycoporum antecellens			Fg				1		
Normandina acroglypta			Fg						
Normandina pulchella			Fg						
Ochrolechia microstictoides		Q			Q				
Opegrapha atra			Fg,Sb	Fg	Fg	Fg			
Opegrapha corticola			Fg	Q,Fg	Fg	Fg	1		Nb (IR)
Opegrapha ochrocheila				LFg	LFg				
Opegrapha soreidifera			Fg						
Opegrapha varia			Fg	LFg	Fg				
Opegrapha vermicellifera	Fg		Fg,LFg	Q,Fg	Fg	Fg			
Opegrapha vulgata	Fg		Fg		Fg	Fg			
Pachnolepia pruinata					Fg				
Pachyphiale carneola			Fg	Q			1		
Parmelia saxatilis s. lat.	Q								
Parmelia sulcata	QTw,Q								
Parmeliopsis ambigua					LQ				
Parmotrema perlatum	Q								
Pertusaria flavida				Q	Q				
Pertusaria hymenea	Fg		Fg	Q,Fg	Fg,Q	Fg			
Pertusaria pertusa			Fg		Fg				
Pertusaria pustulata					Fg				VU (NR)
Phlyctis argena	Q,Fg		Fg						
Physcia tenella	QTw								
Porina aenea			Fg						
Porina borreni	Fg		Fg	Fg	Fg	Fg			Nb (NS)
Porina byssophila	Fg		Fg,Co	Fg	Q,Fg	Fg			Nb (NS)
Porina hibernica			Fg				1		NT (NS/IR/S41)
Porina leptalea			Fg		lx				
Porina multipuncta				Q					
Pseudoschismatomma rufescens		Fg							
Psilolechia lucida			T						
Psoroglaena stigonemoides			Fg	Fg					
Pyrenula chlorospila			Fg		Fg	Fg			
Pyrenula nitida			Fg	Fg	Fg	Fg			VU (NR/S41)
Pyrenula nitidella			Fg		Fg	Fg			Ex (NR)
Pyrrhospora quemea	Q	Fg,Q		Q	Q				
Ramalina farinacea	Q								
Rinodina roboris var. roboris			Fg		Fg				Nb (IR)
Scoliciosporum pruinatum	Q								
Scutula circumspecta			Fg						VU (NS/S41)
Scytinium subtile			Fg						Nb (NS)
Sporodoporon cretaceum			Fg	Q,Fg	Fg	Fg			Nb (IR)
Stenocybe septata					lx	lx	1		Nb (IR)
Strigula taylorii			Co,Fg		Fg	Fg			Nb (NS/IR)
Taeniolella punctata			Fg,Z0533						
Thelopsis rubella			Fg	Fg	Fg	Fg	1		
Thelotrema lepadinum		Q	Q,Fg		Q,Fg	Fg,Q	1		
Trapeliopsis flexuosa	LQ	LQ			LQ				
Trapeliopsis gelatinosa					T				
Trapeliopsis pseudogranulosa	T	LQ	Q		T				
Xanthoria parietina	Fg								
Byrophytes									
Zygodon forsteri			Fg	Fg,LFg	Fg,LFg	LFg,Fg			EN (NR/S41)

Totals (Lichens)

Biodiversity Measure \ Date	All	2018-20	EIMD	SMP	WMS	PH	CTH	BW
Total taxa	174	121	107	50	77	36	20	11
Southern Oceanic Woodland Index score	21	19	2	7	12	8	10	7
Pinhead Lichen Index score	13	10	4	8	3	3	7	5
Extinct (recently re-found)	1	1	0	0	1	0	1	0
Vulnerable	4	4	0	0	3	2	3	1
Near Threatened	1	1	0	0	1	0	0	0
Notable	20	17	5	5	9	6	14	8
Nationally Rare	4	4	0	0	2	1	3	0
Nationally Scarce	20	19	6	6	7	6	11	5
International Responsibility Species	7	6	0	0	5	2	5	4
Section 41 species	4	4	0	0	4	2	2	1
TNTN score	40	37	5	5	25	14	30	12

ANNEX 3 Maps

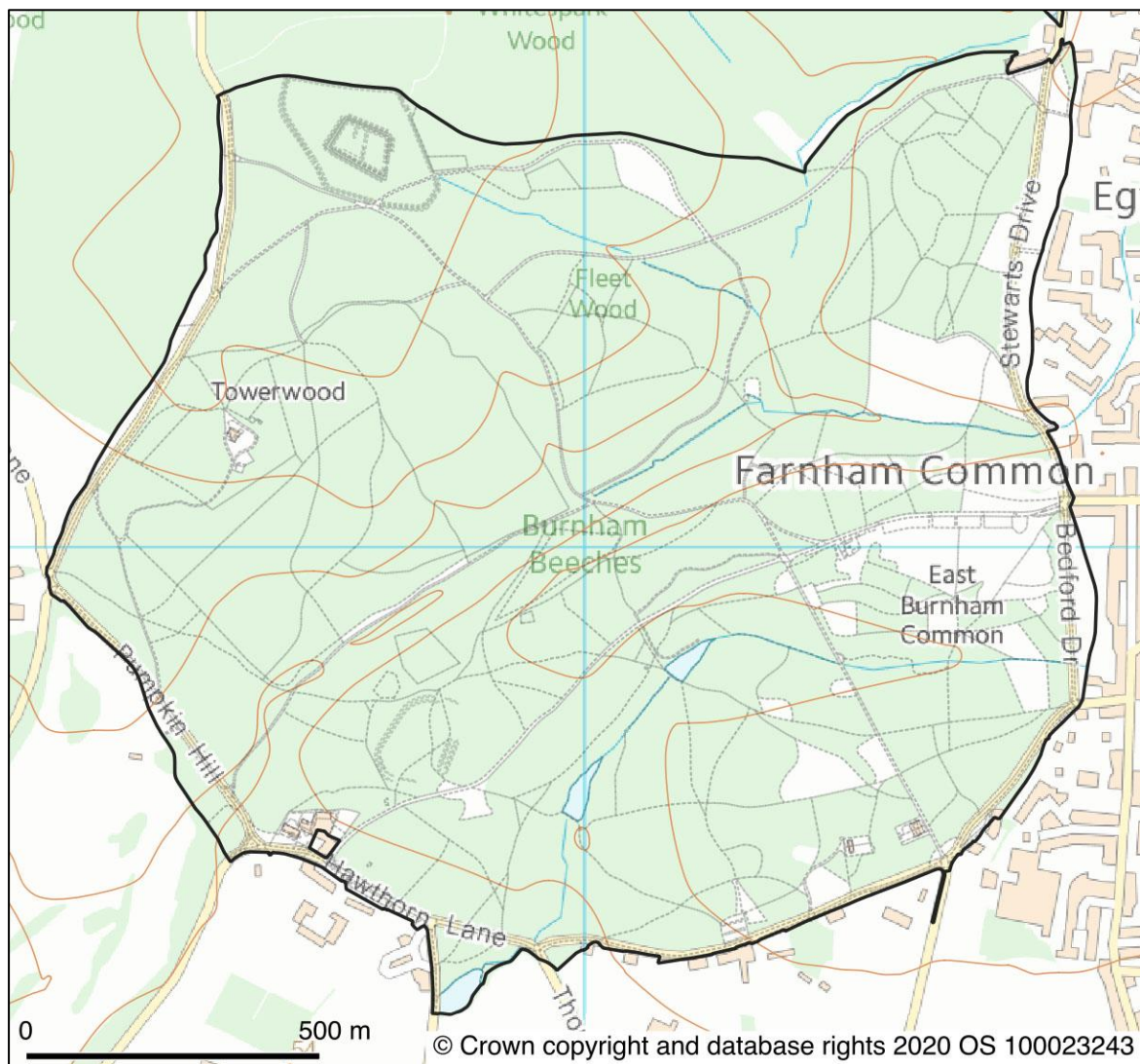
B1 General Maps

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

Burnham Beeches Lichen Survey

Location

Map 1

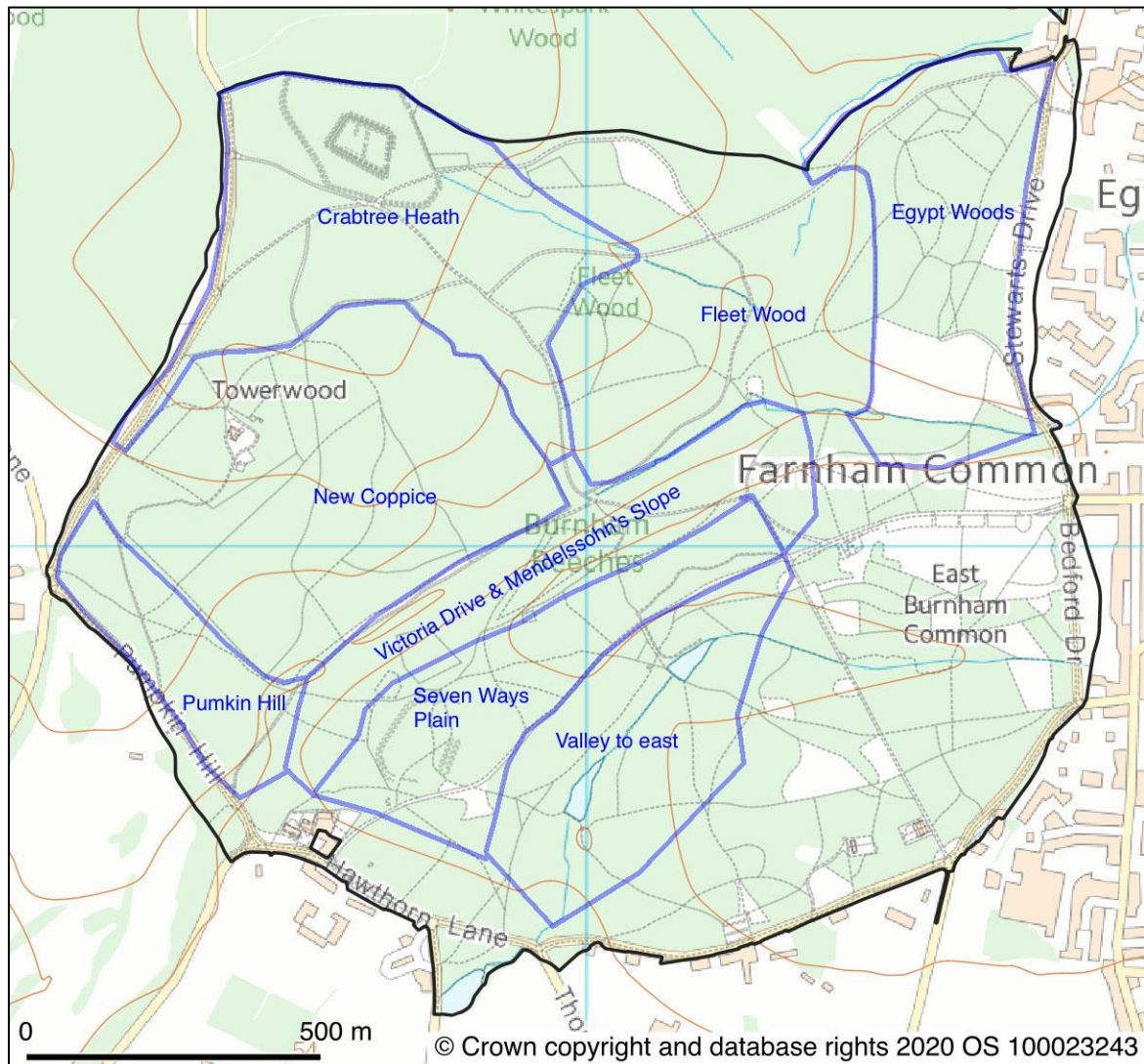


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Burnham Beeches Lichen Survey

Lichen Survey Areas

Map 2

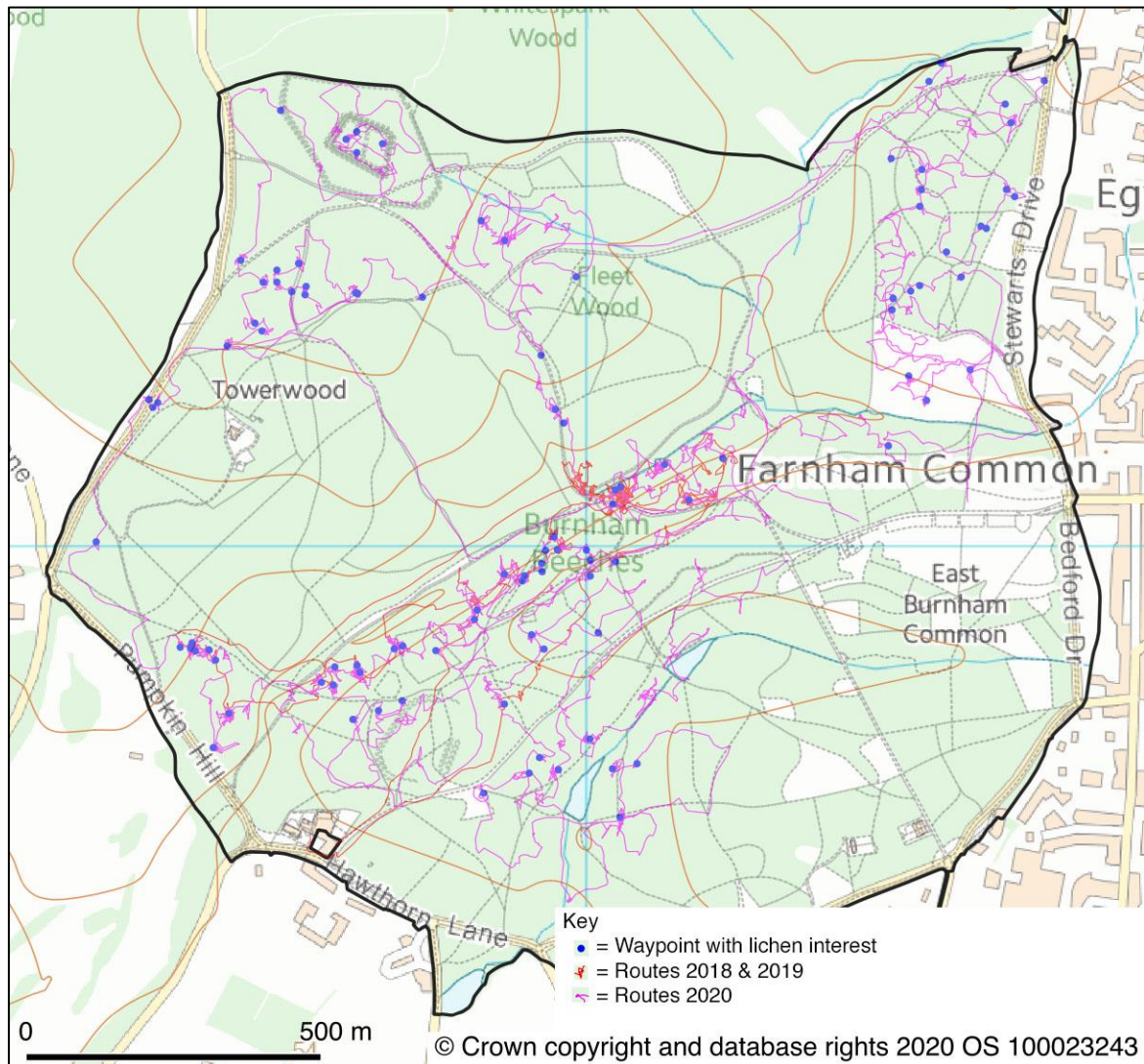


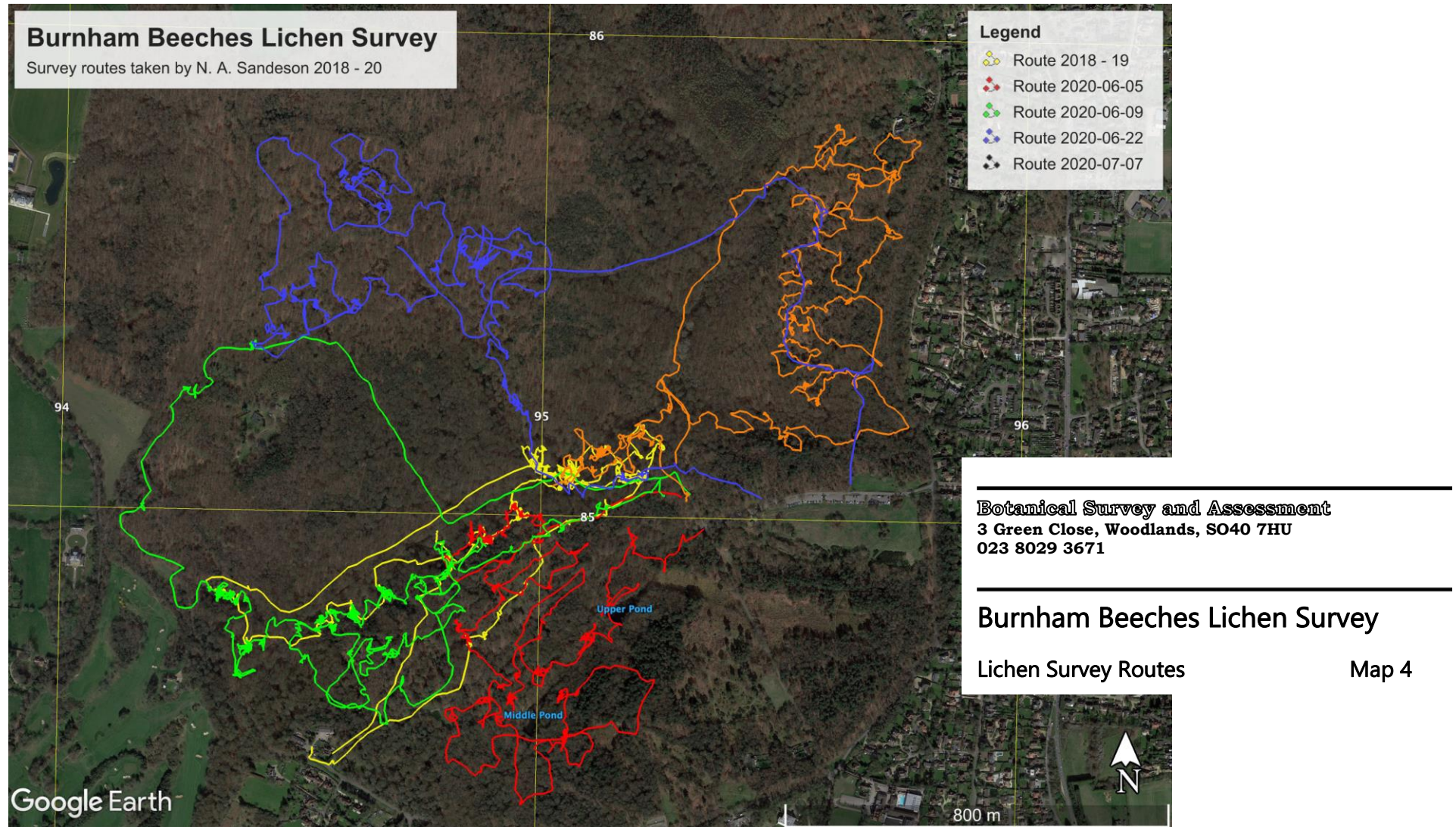
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Burnham Beeches Lichen Survey

Lichen Survey Routes

Map 3





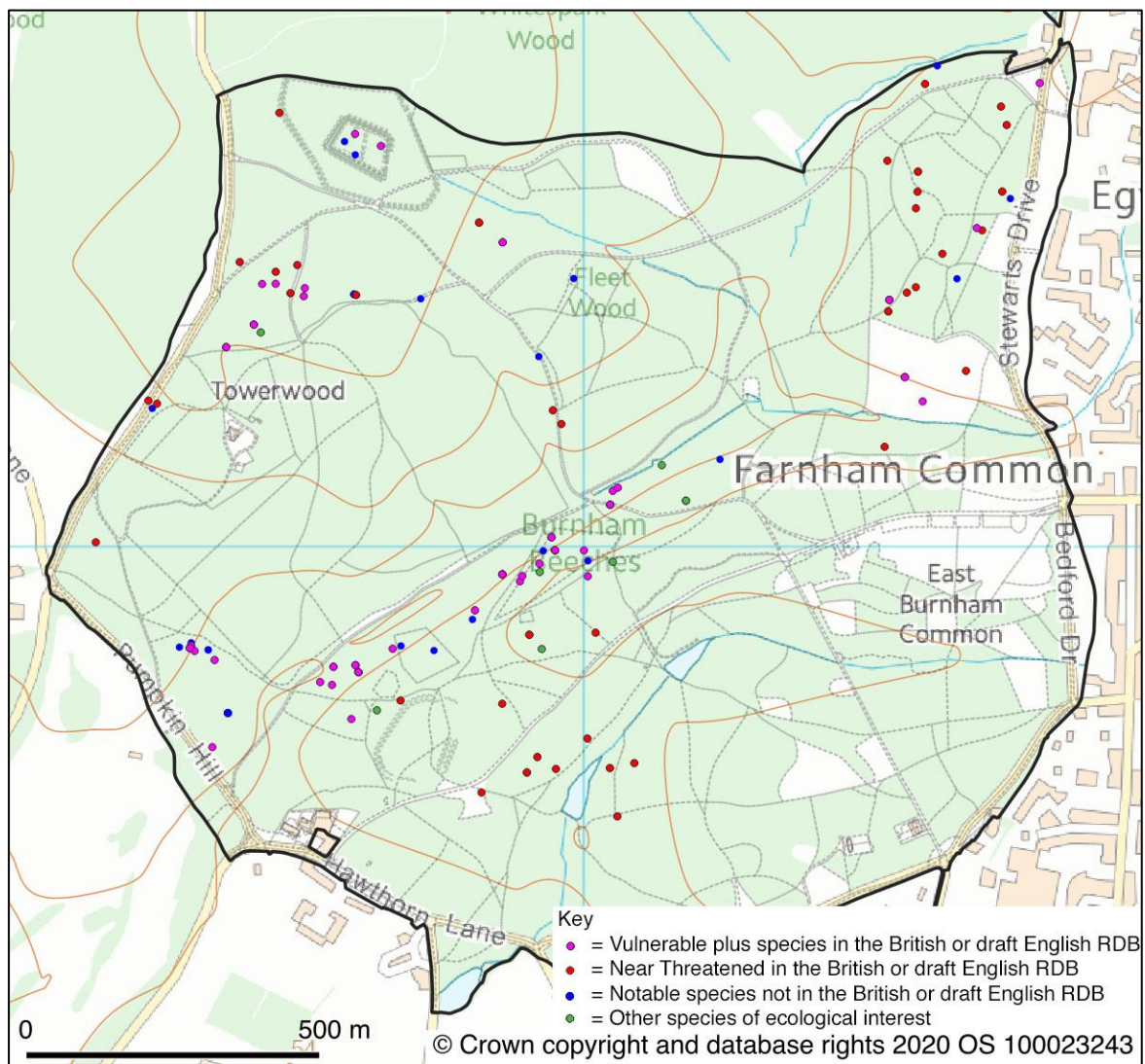
B2 Conservation and Habitat Maps

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Burnham Beeches Lichen Survey

Conservation Value

Map 5

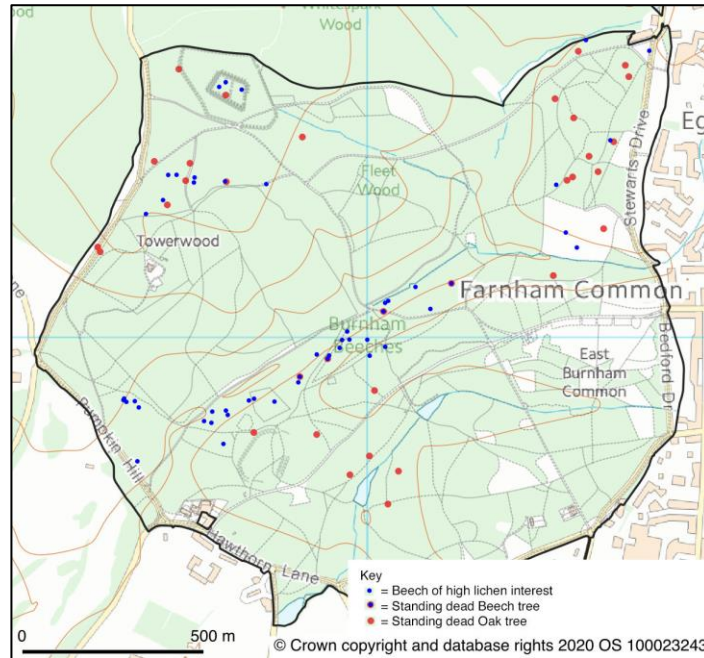


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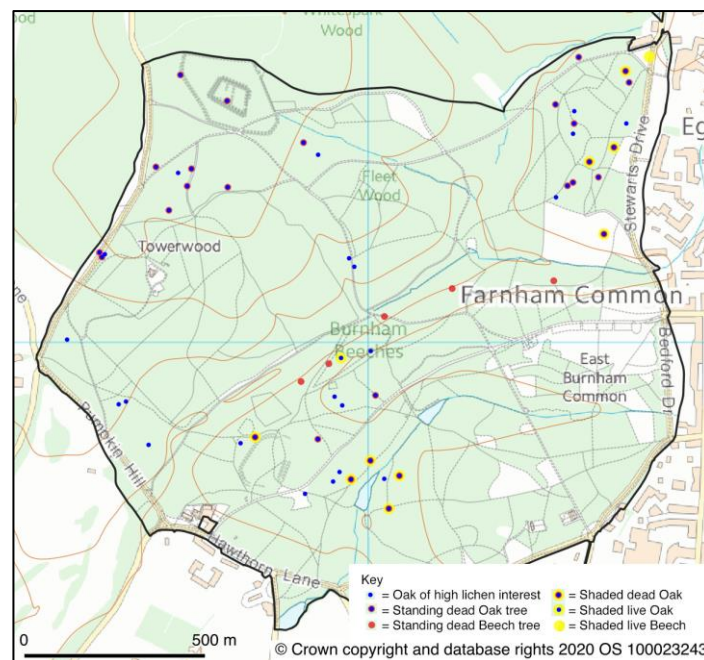
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Beech & Oak of Interest

Maps 6 & 7



Beech



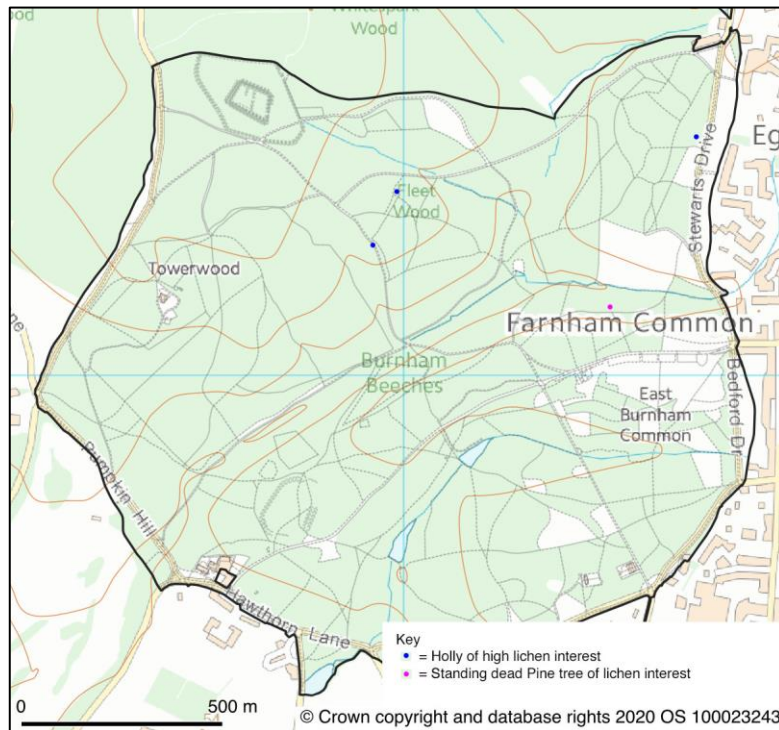
Oak

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Holly & Pine of Interest

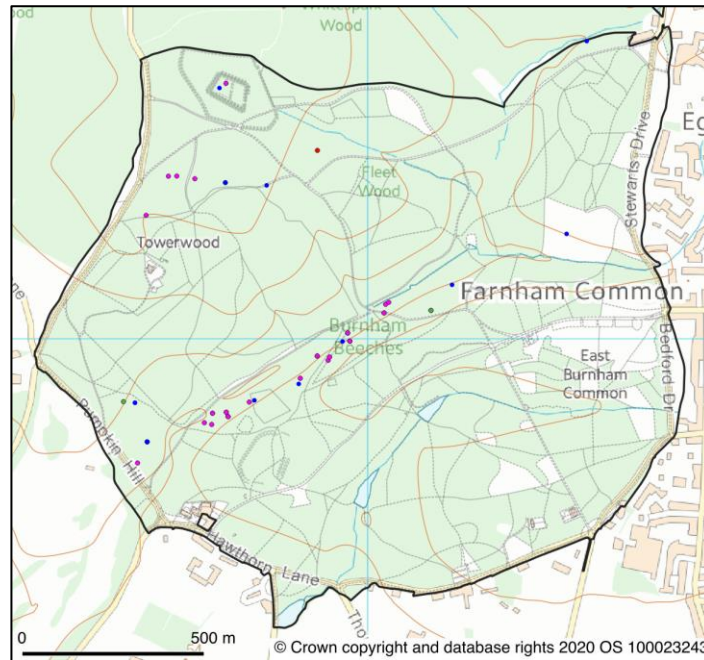
Map 8



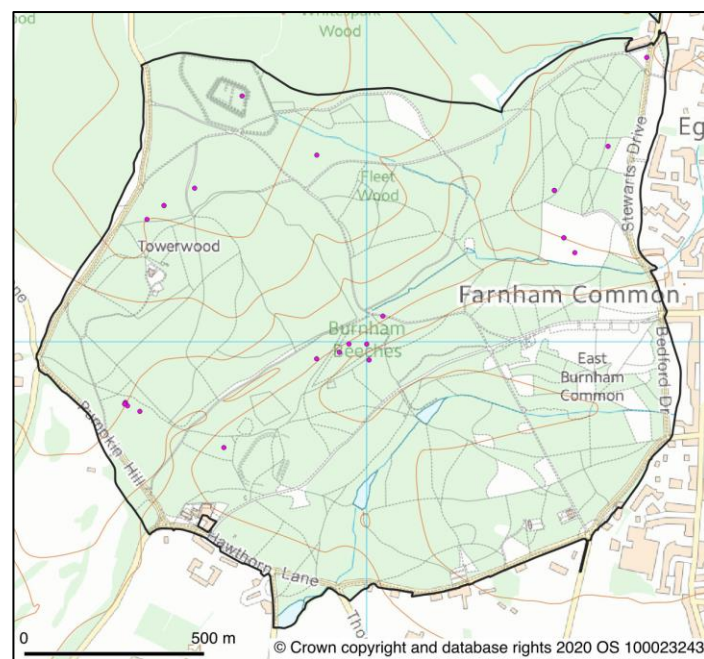
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Flushed Bark & Wound Tracks Maps 9 & 10



Flushed bark habitats of high interest



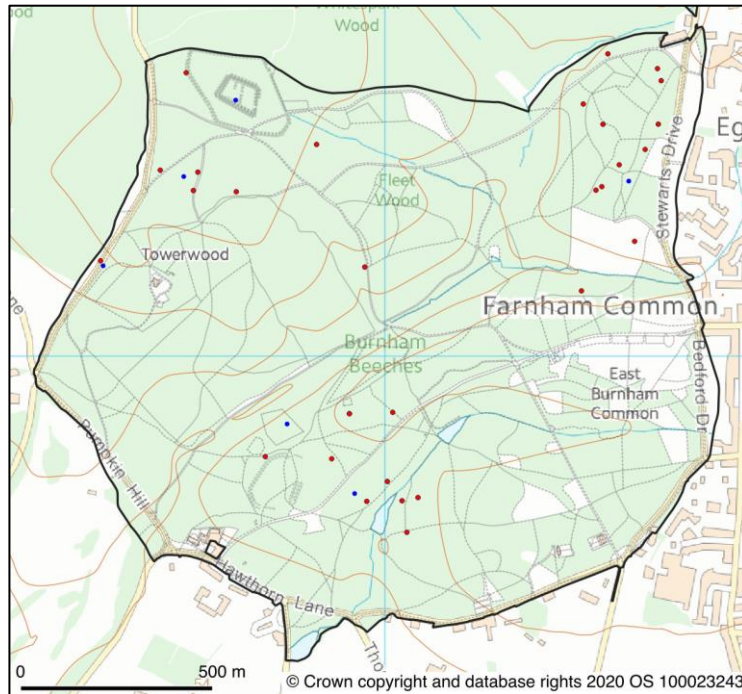
Wound track habitats of high interest

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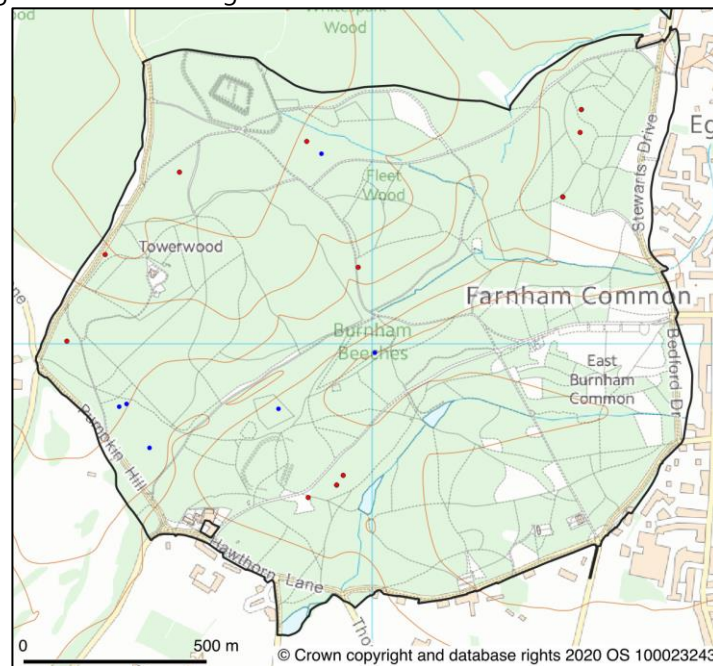
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Lignum & Dry Bark

Maps 11 & 12



Lignum habitats of high interest

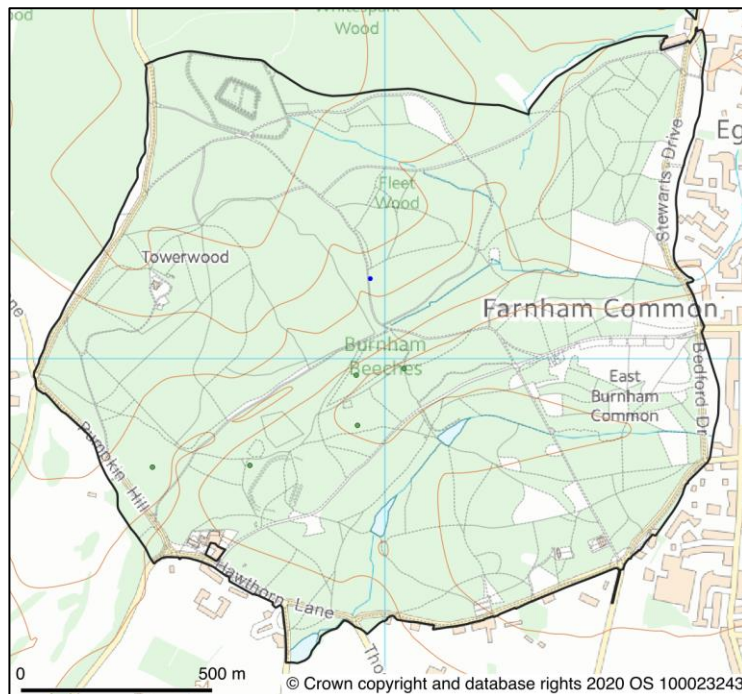


Dry bark habitats of high interest

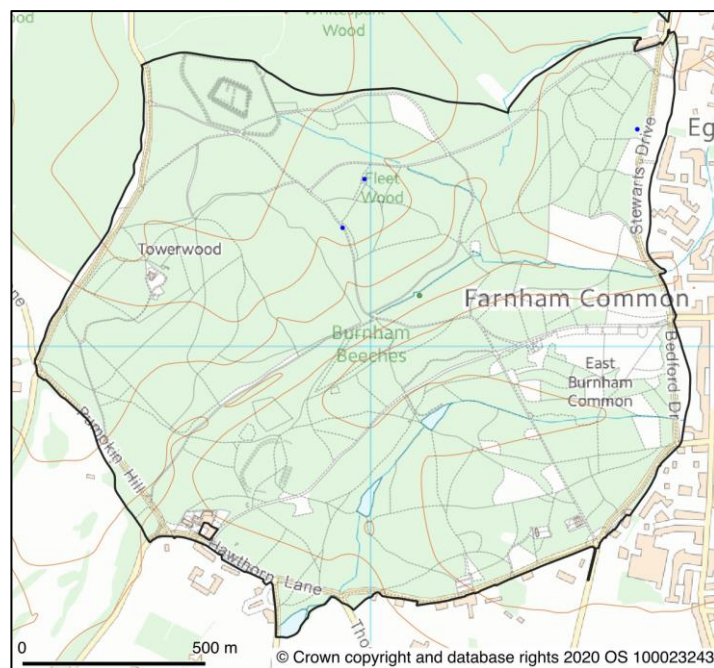
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Acid Bark & Smooth Bark Maps 13 & 14



Acid Bark habitats of high interest



Smooth Bark habitats of high int

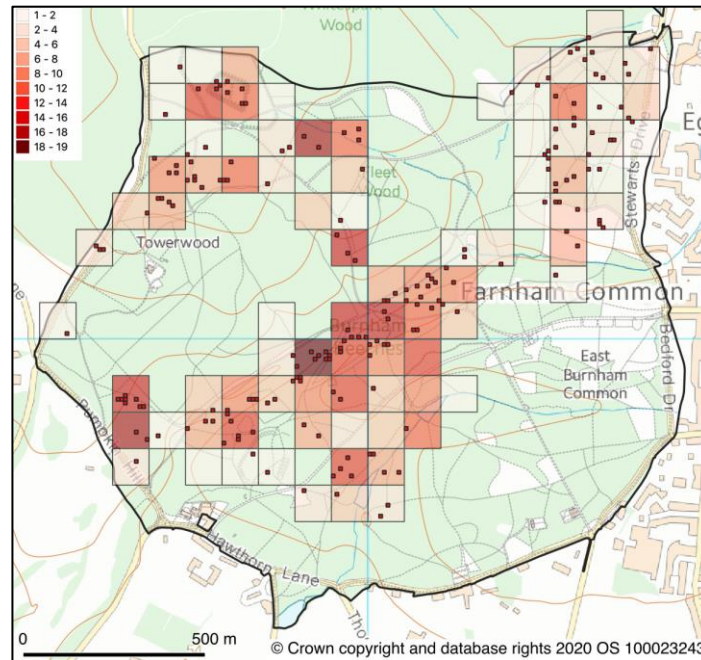
B3 Lichen Species Maps

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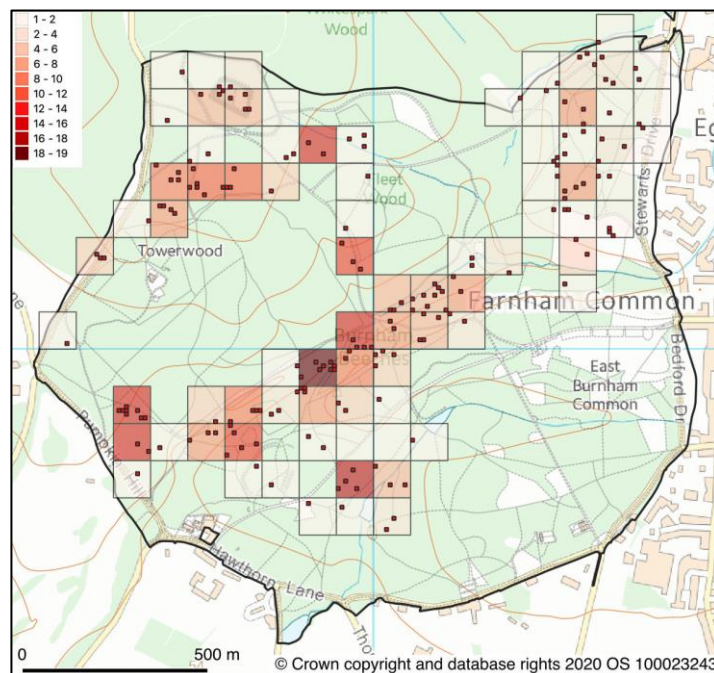
Burnham Beeches Lichen Survey

Survey Density

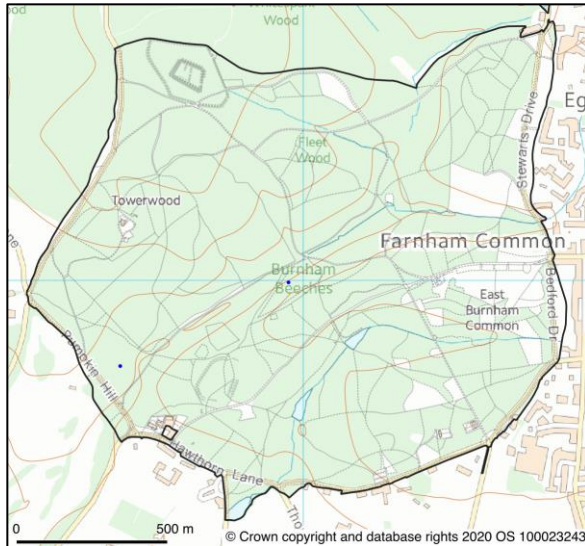
Maps 15 & 16



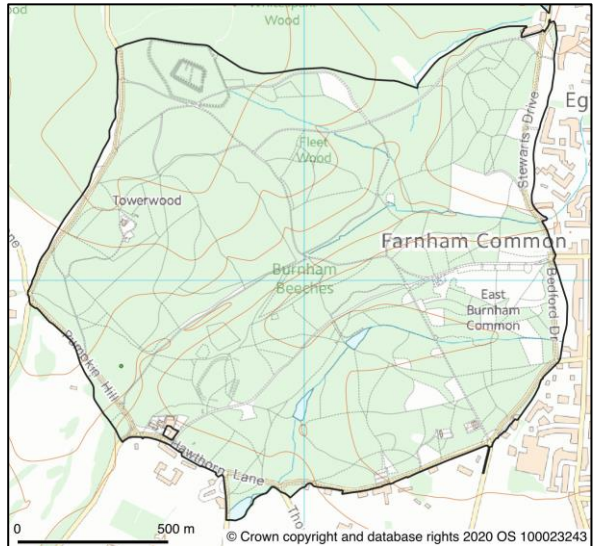
Density of all species in 100m squares & occurrence species of interest in 10m squares



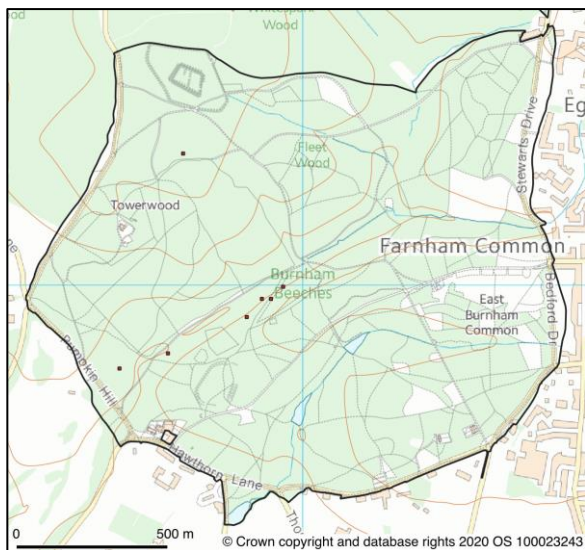
Density of species of interest in 100m squares & occurrence in 10m squares



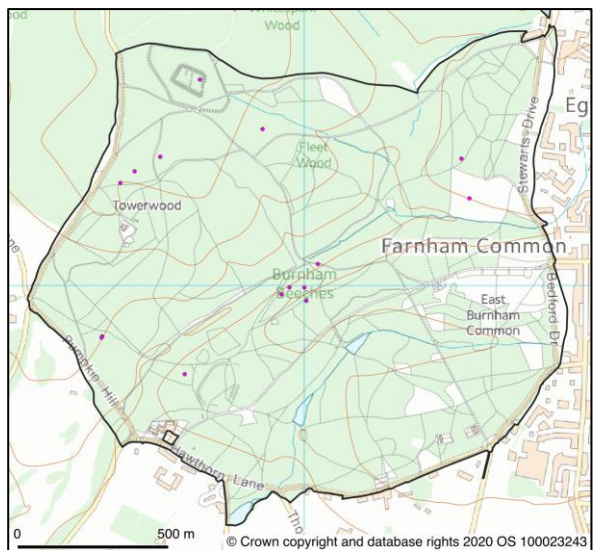
Map 17 *Agonimia flabelliformis*



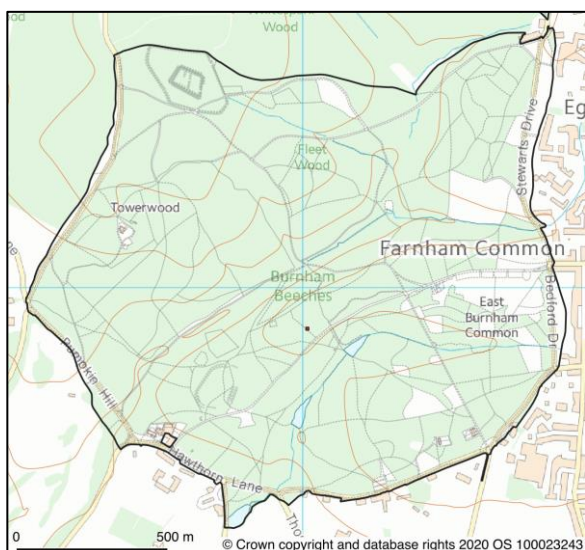
Map 18 *Anisomeridium ranunculosporum*



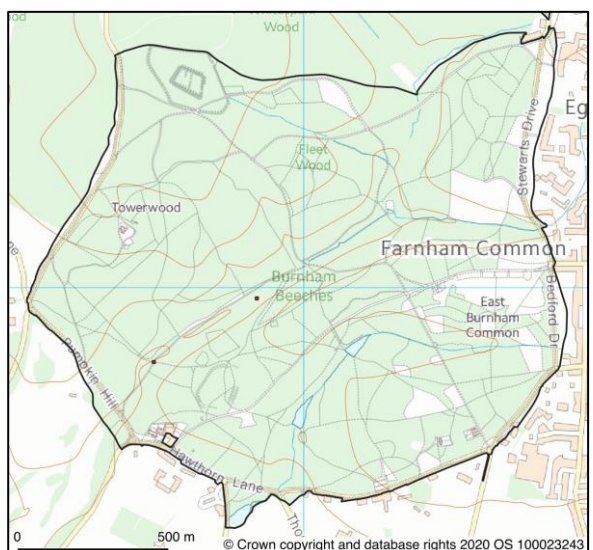
Map 19 *Bacidina phacodes*



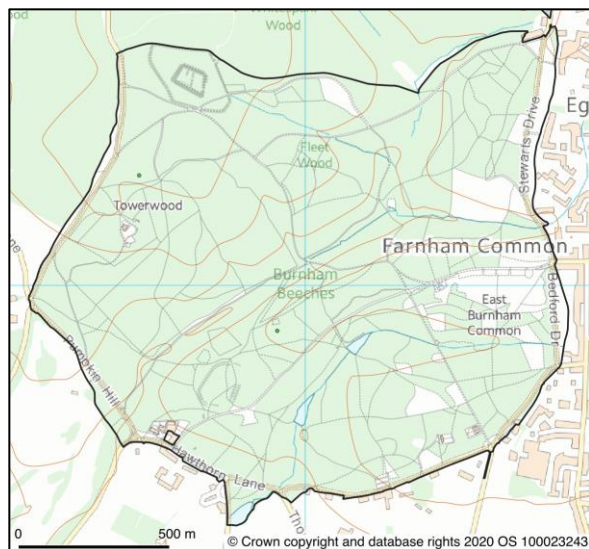
Map 20 *Bellicidia incompta* (*Bacidia incompta*)



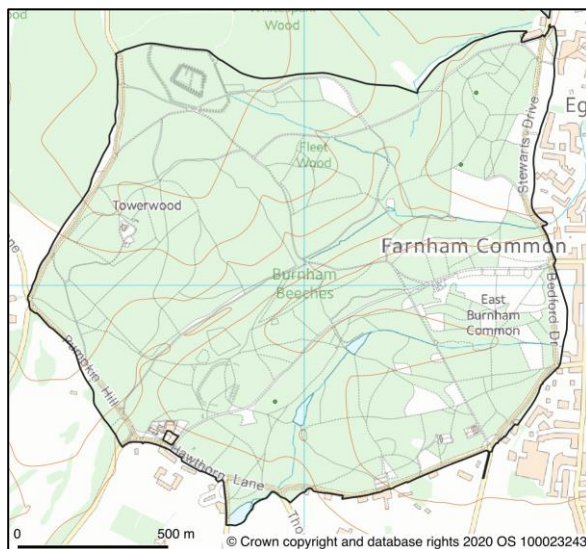
Map 21 *Calicium glaucellum*



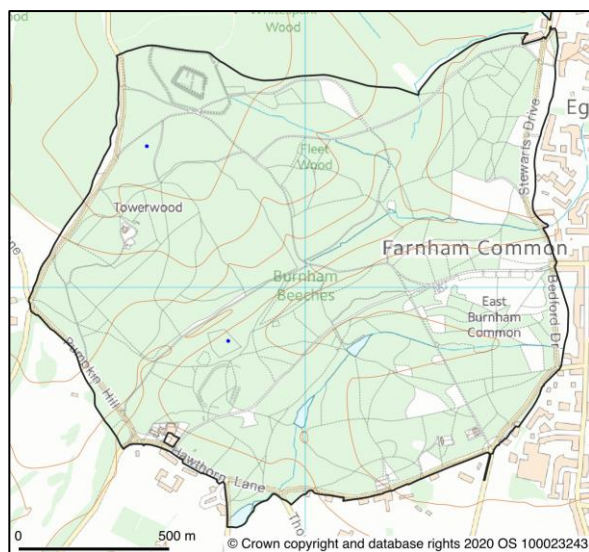
Map 22 *Chaenotheca brachypoda*



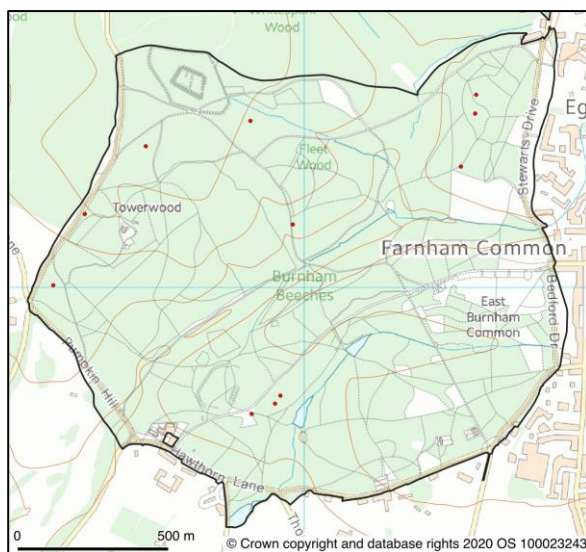
Map 23 *Calicium brunneola*



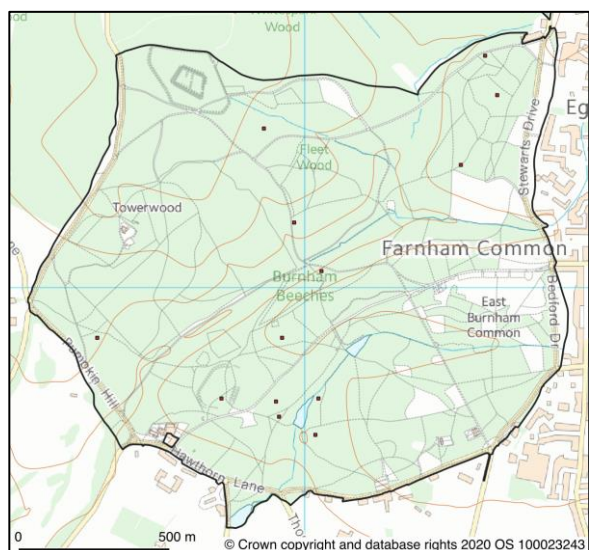
Map 24 *Chaenotheca chrysocephala*



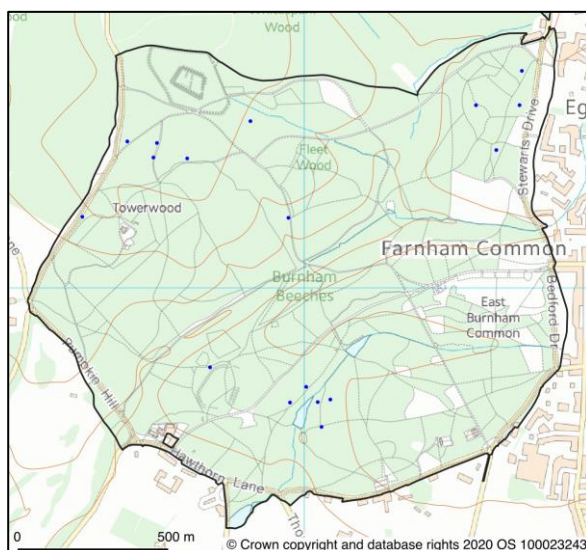
Map 25 *Calicium hispidula*



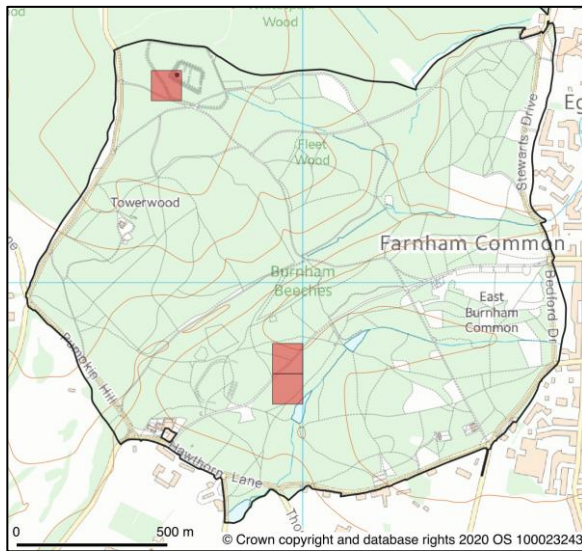
Map 26 *Chaenotheca stemonea*



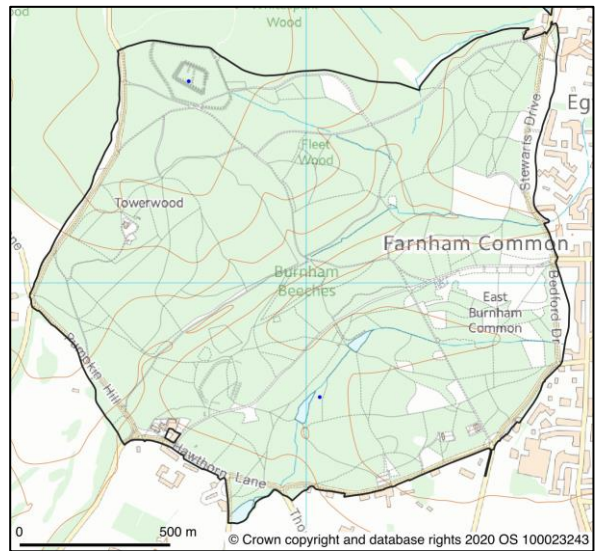
Map 27 *Calicium trichialis*



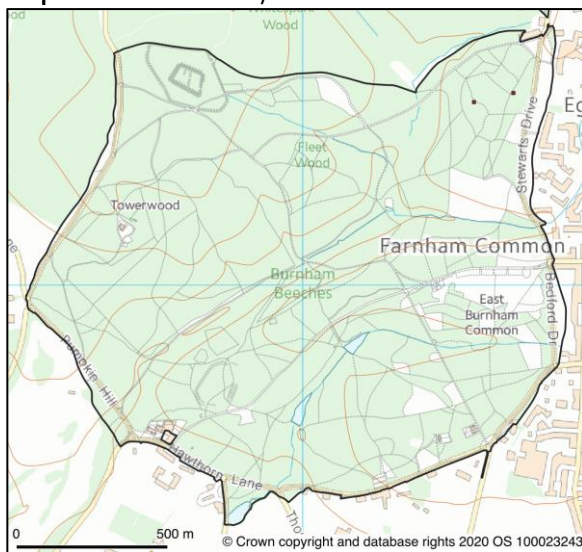
Map 28 *Chaenothecopsis nigra*



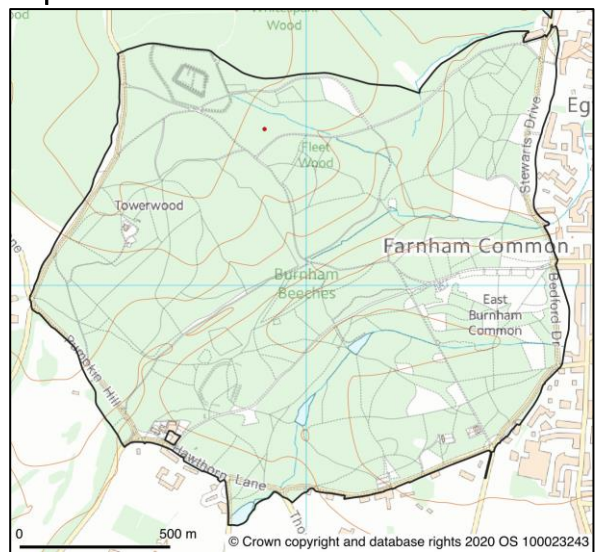
Map 29 *Cladonia caespiticia*



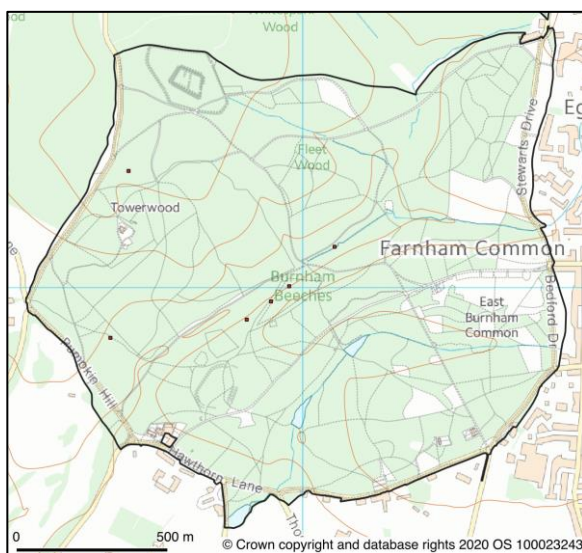
Map 30 *Cladonia incrassata*



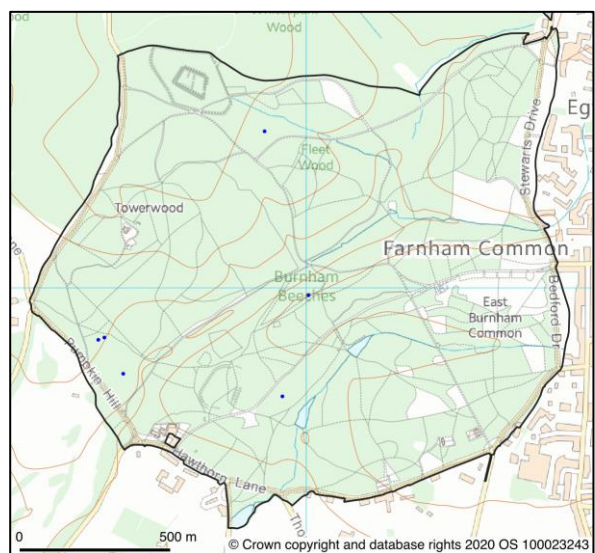
Map 31 *Cladonia parasitica*



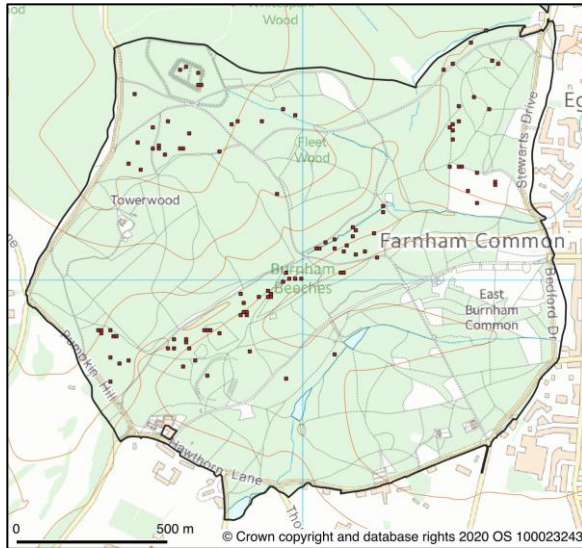
Map 32 *Coenogonium tavaresianum*



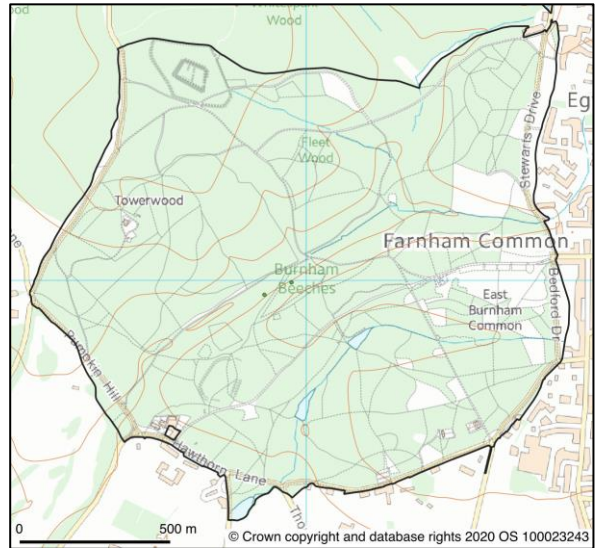
Map 33 *Coniocarpon cinnabarinum*



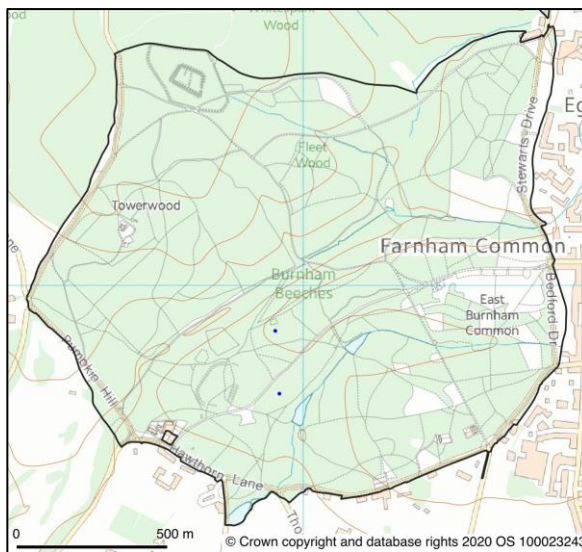
Map 34 *Cresponea premnea*



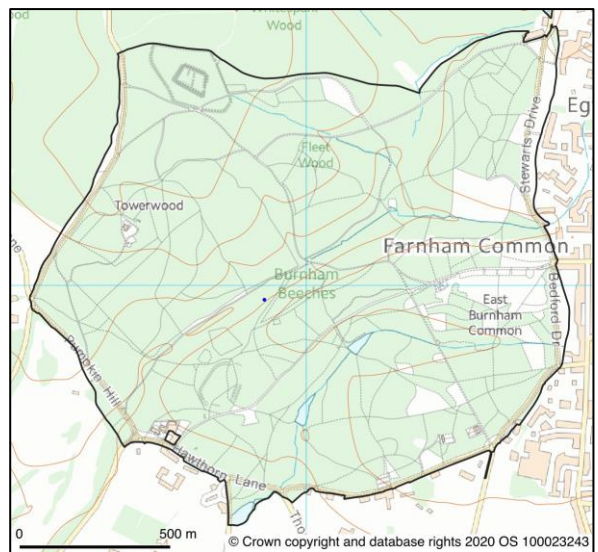
Map 35 *Enterographa crassa*



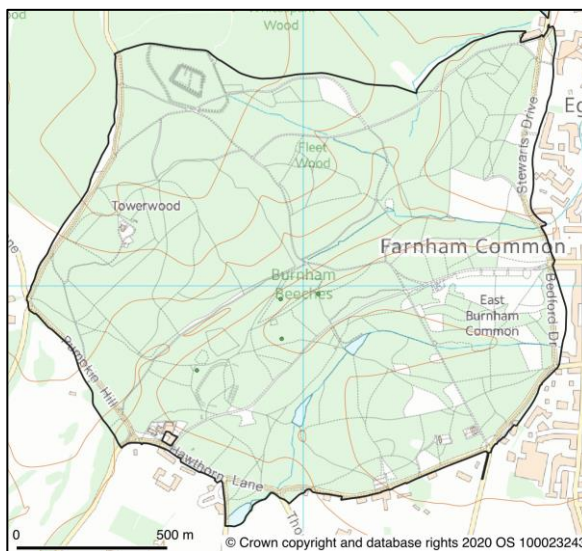
Map 36 *Lecanora jamesii*



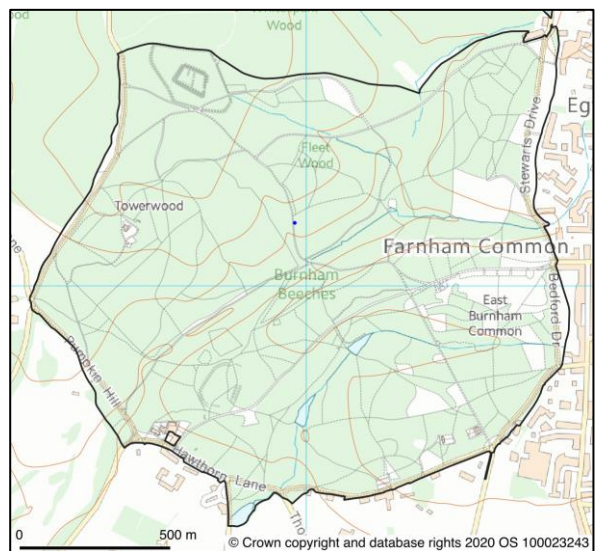
Map 37 *Lecideia nylanderii*



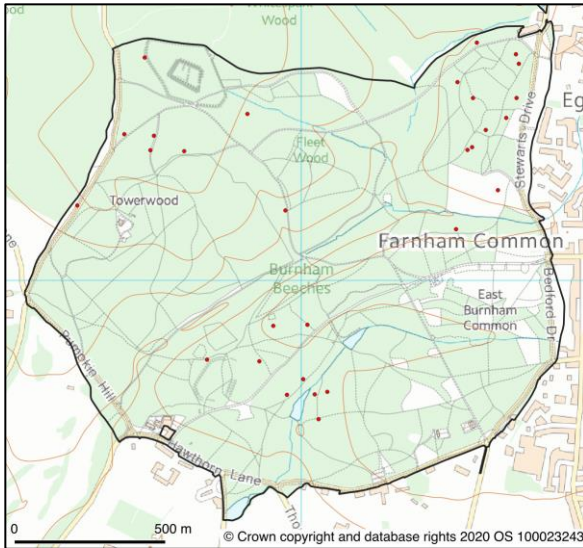
Map 38 *Scytinium subtile* (*Leptogium subtile*)



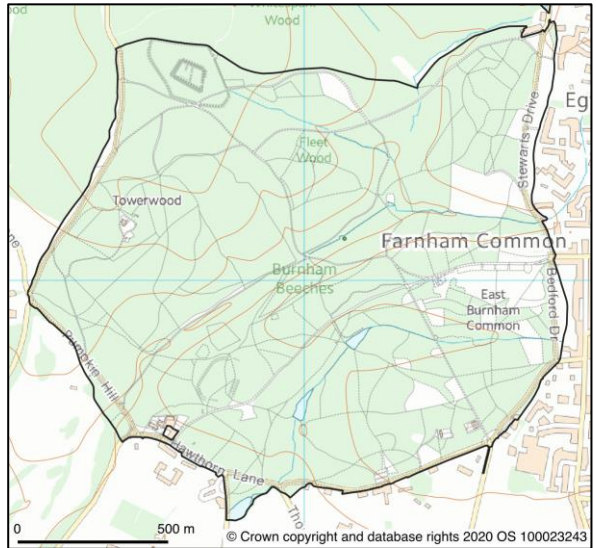
Map 39 *Loxospora elatina*



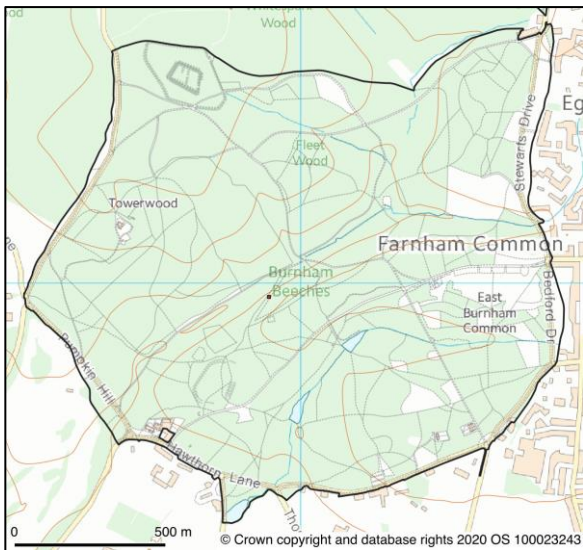
Map 40 *Micarea doliiformis*



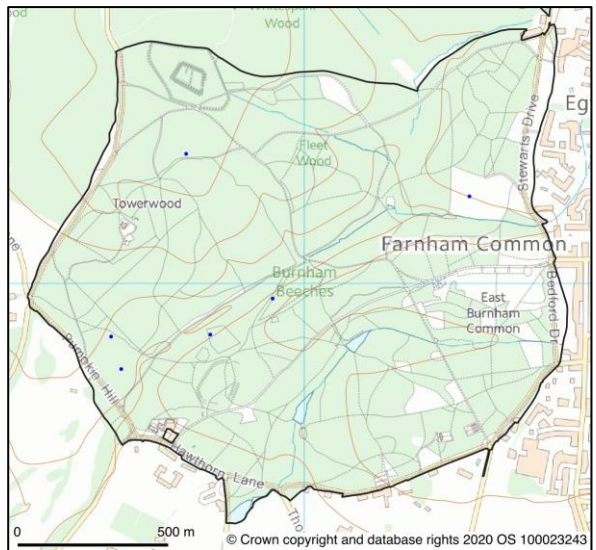
Map 41 *Microcalicium ahlneri*



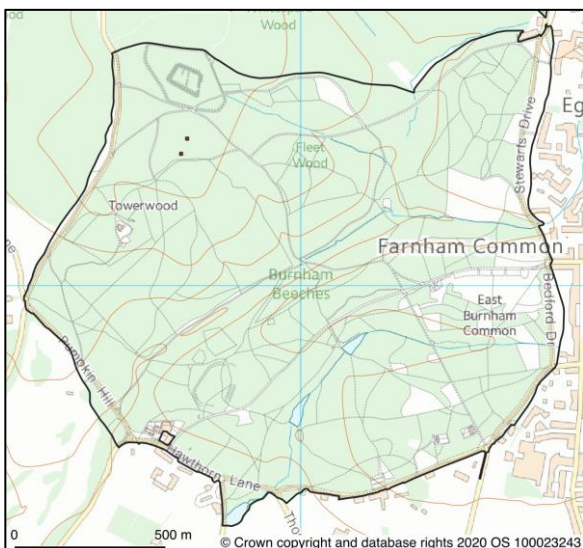
Map 42 *Mycoporum antecellens*



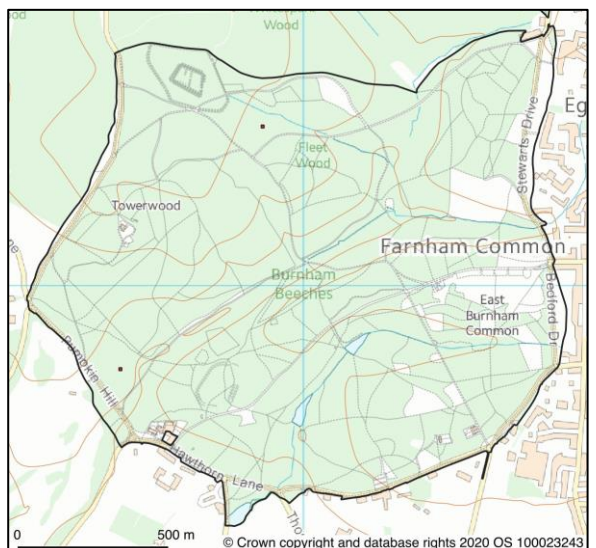
Map 43 *Normandina acroglypta*



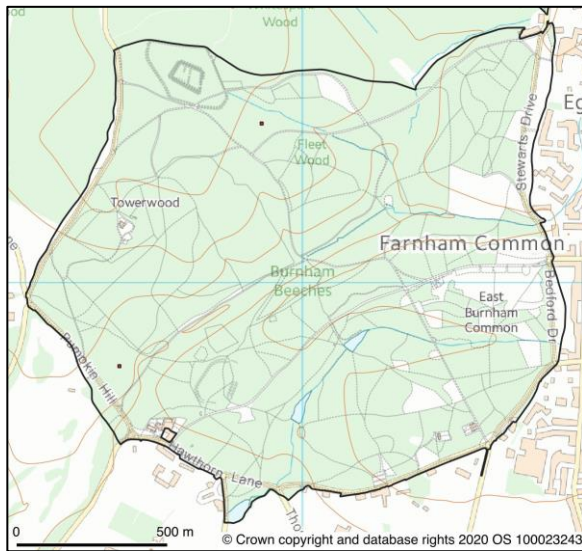
Map 44 *Opegrapha corticola*



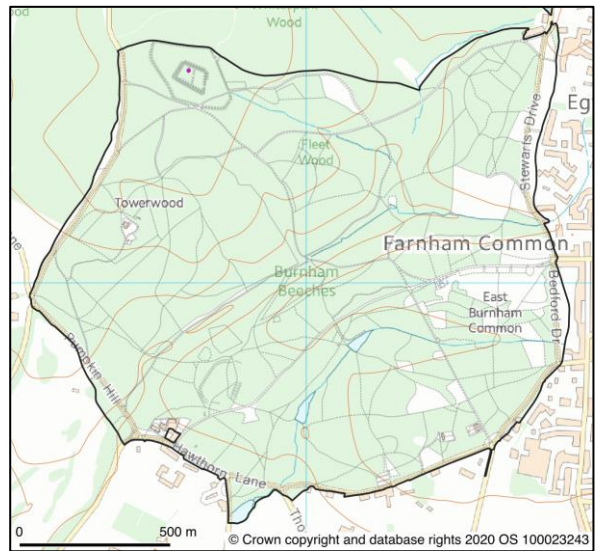
Map 45 *Pachnolepia pruinata* (*Arthonia pruinata*)



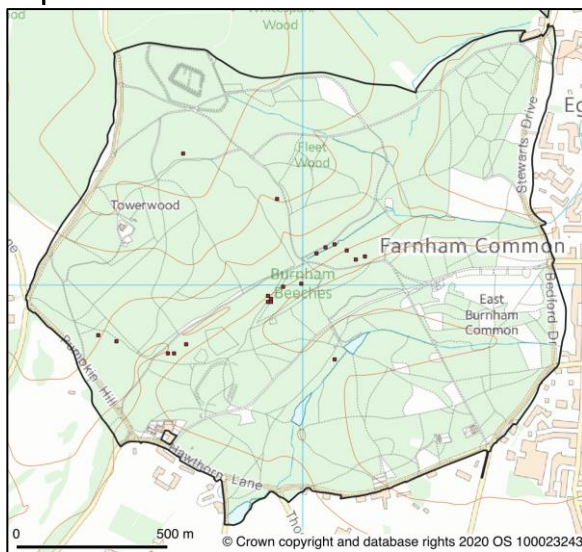
Map 46 *Pachyphiale carneola*



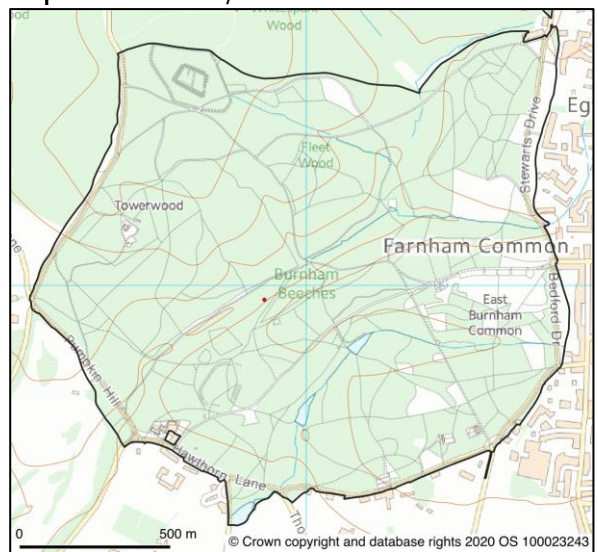
Map 47 *Pertusaria flavida*



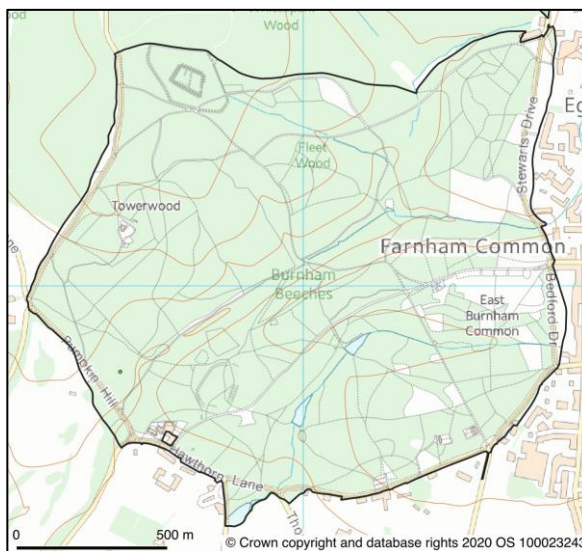
Map 48 *Pertusaria pustulata*



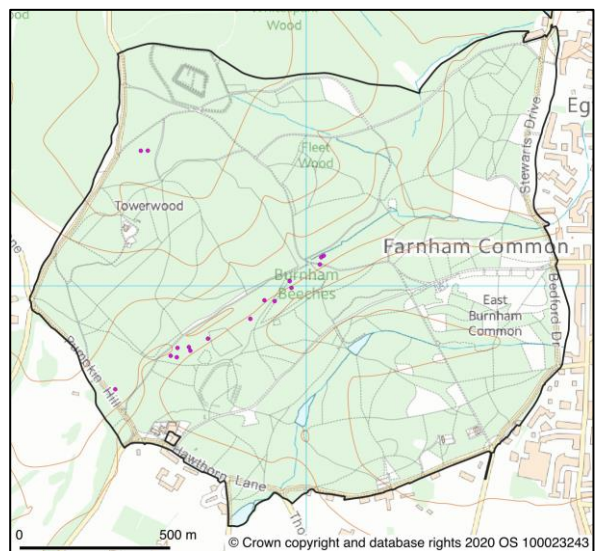
Map 49 *Porina borrieri*



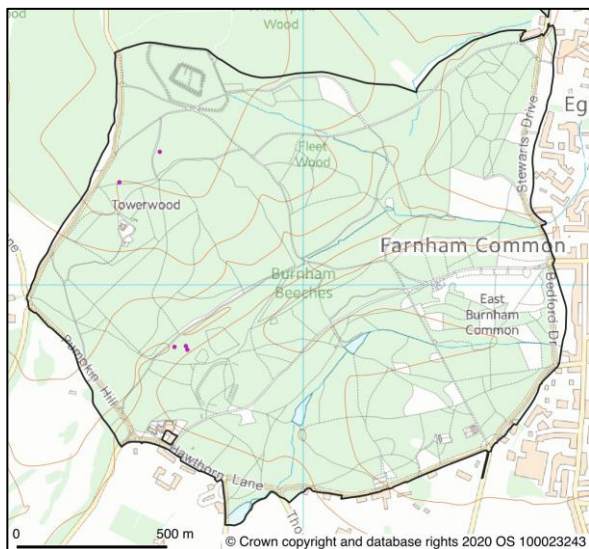
Map 50 *Porina hibernica*



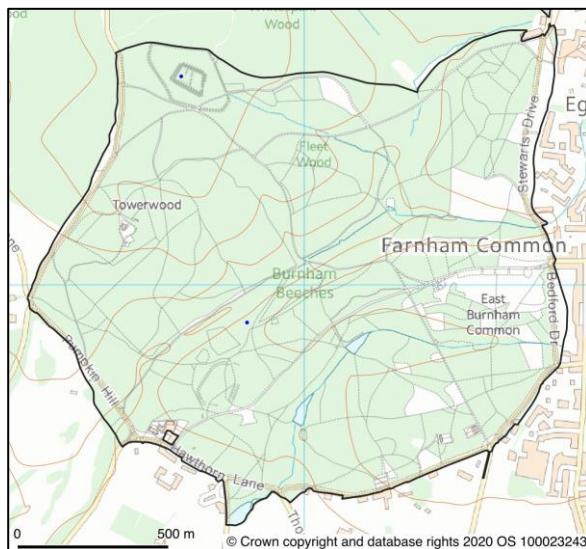
Map 51 *Porina multipuncta*



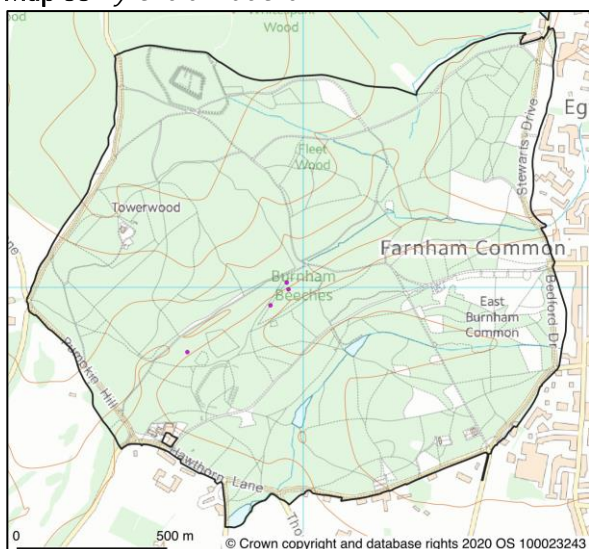
Map 52 *Pyrenula nitida*



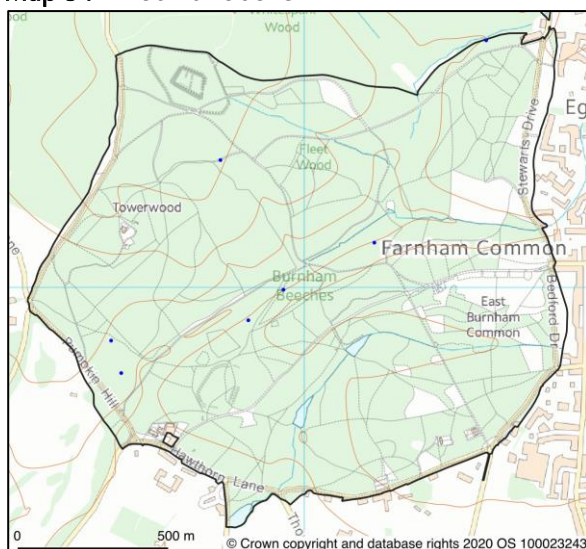
Map 53 *Pyrenula nitidella*



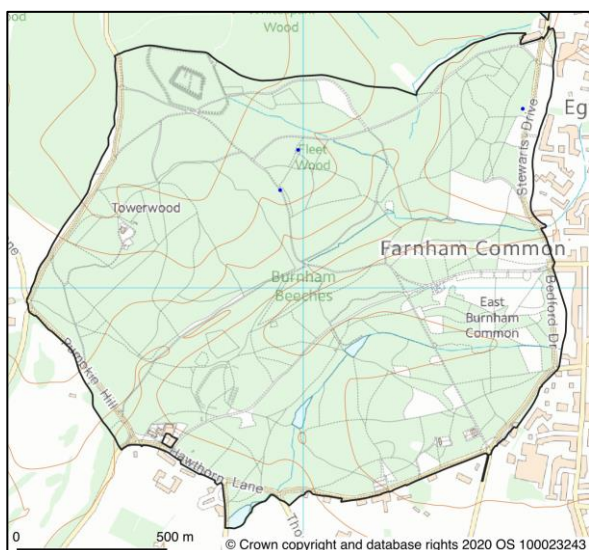
Map 54 *Rinodina roboris*



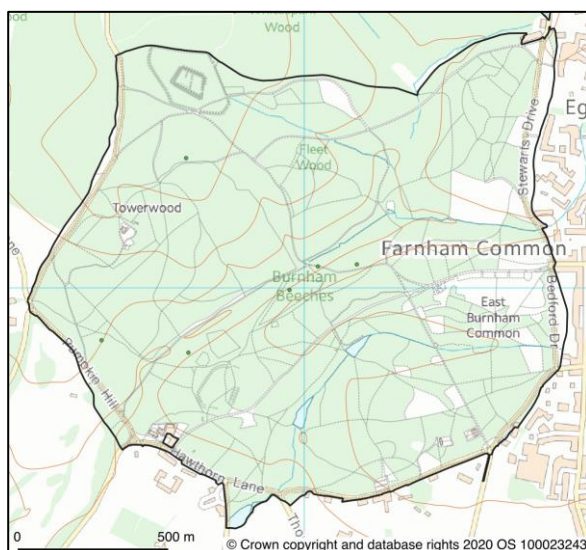
Map 55 *Scutula circumspecta* (*Bacidia circumspecta*)



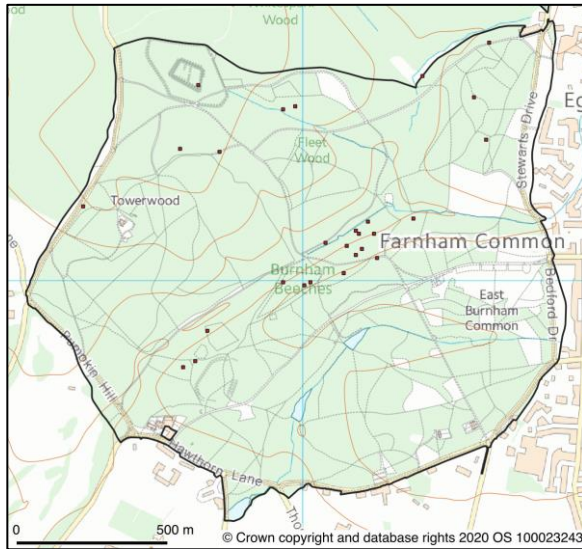
Map 56 *Sporodophoron cretaceum*



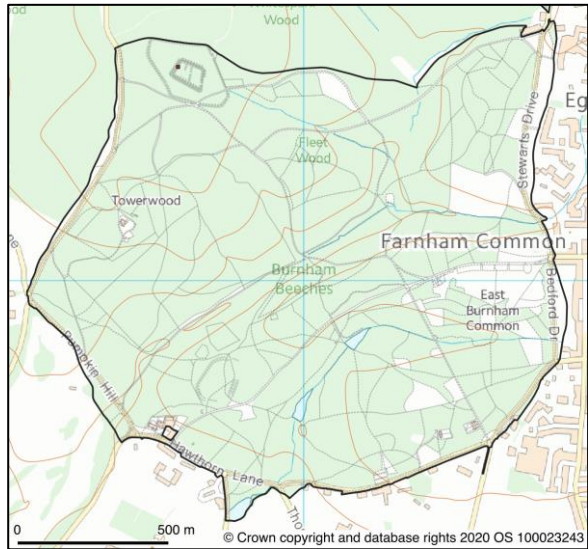
Map 57 *Stenocybe septata*



Map 58 *Thelopsis rubella*

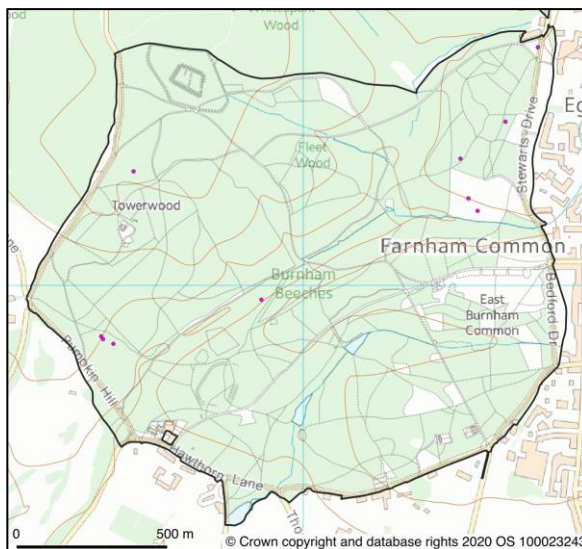


Map 59 *Thelotrema lepadinum*



Map 60 *Trapeliopsis gelatinosa*

B4 Bryophytes Species Map



Map 61 *Zygodon forsteri*

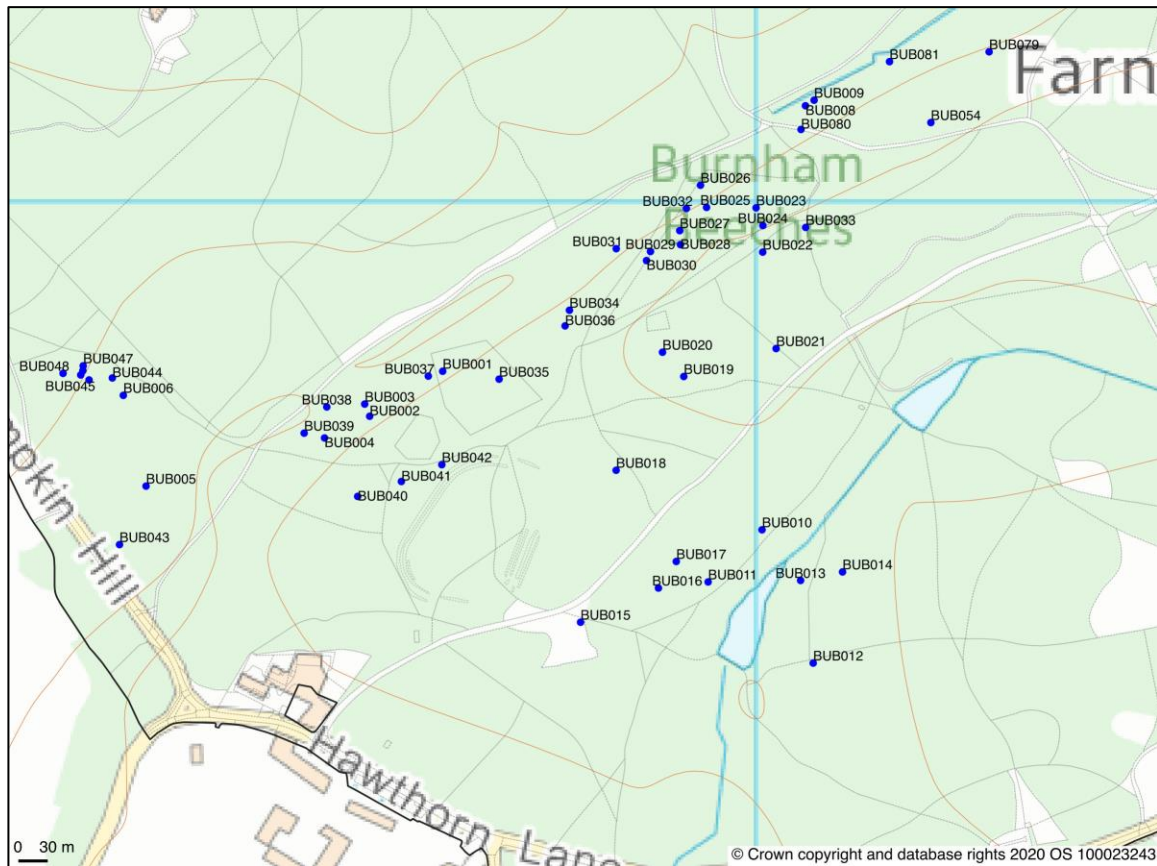
B4 Waypoint Locations

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Waypoints SW

Map 61

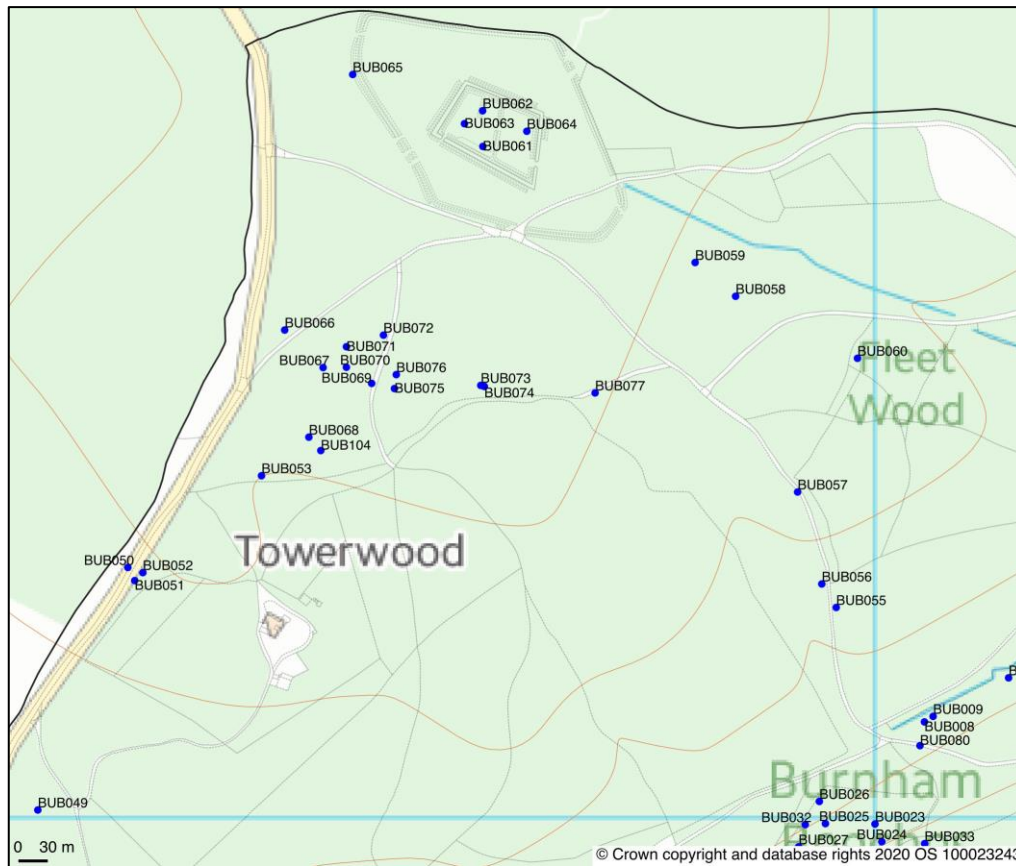


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Waypoints NW

Map 62



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Burnham Beeches Lichen Survey

Waypoints NE

Map 63

