

# **A Lichen Survey of Alfoxton Park**



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## Introduction

Alfoxton Park is a former deer park attached to the eighteenth century Alfoxton House. All parts of the park are in hectad ST14, in the botanical vice-county of South Somerset (V.C. 5).

The county of Somerset is well-recorded for lichens (Wolseley *et al.* 2020), and Alfoxton has been visited by lichenologists in the past, though no reports have been seen.

## Methods

The site was visited on 29 and 30 March 2022, in dry weather.

The lichen nomenclature used is fairly conservative, following the recording spreadsheet in use by the British Lichen Society in 2022. Therefore some recent name changes have not been followed.

Species were regarded as ‘notable’, if they either achieve a conservation grading in Sanderson *et al.* (2018), or they are listed on the Southern Oceanic Woodland Index of Ecological Continuity (SOWI) (Sanderson *et al.* 2018).

At one site, lichens on twigs were recorded using the APIS method for estimation of threat from ammonia (<http://www.apis.ac.uk/nitrogen-lichen-field-manual>), with some modifications to the species list used.

## Results

A total of 101 species was recorded, all on either bark or wood (Table 1). Seventeen species are considered to be ‘notable’ (Table 2). Some apparently rare species are not regarded here as notable: *Porina byssophila* is listed as Nationally Rare by Sanderson *et al.* (2018), but this is an overlooked and fairly frequent species. *Andreomyces obtusaticus* was only recently reported as new to Great Britain, and the record for Alfoxton is only the fifth British record, but it is likely that this species has been much overlooked. Thirteen SOWI species were recorded (Table 2). Locations where records were made are shown in Fig. 1. A list of grid references of localities is shown in Table 3.

Mature and over-mature oaks are the most important trees in the park. The old-forest species *Cresponea premnea* is frequent and often abundant on trunks. *Chaenotheca trichialis* is occasional in dry bark crevices (Figs. 2). Open woodland at the east end of the site (Fig. 10) is the main or only area for *Lecanographa lyncea* and *Snippocia nivea*. An ancient oak not far from the house has *Cresponea premnea*, *Lecanographa lyncea*, *Chaenotheca trichialis*, *Inoderma subabietinum* (only found on one other oak), *Opegrapha corticola* (otherwise only seen on one sycamore), *O. xerica* (the only record) and *Rinodina roboris*. Most oak trunks are rather dry from being sheltered from rain by the upper trunk and canopy, so the communities present are limited, dominated by species including *Cresponea premnea*, *Lepraria incana* and *Schismatomma decolorans*, locally with *Lecanographa lyncea* and *Snippocia nivea*. Many of the mature trees in the park are not oak, but trees of lower value for lichens. Sweet chestnut forms good-sized trees but is generally very poor for lichens, though one or two have small amounts of *Cresponea premnea*, and one had *Micarea doliiformis*. Somewhat

younger chestnut seem more likely to have notable species than large trees. Horse chestnut is poor. Ash supports a number of species not found on oak, but little notable, although a small amount of *Cresponea* was found on one ash. Sycamore is valuable as providing more base-rich bark than oak, and supported the notable species *Opegrapha corticola* (one of two trees in the park), *O. prosodea* (the only record in the park) and *Porina borrieri*.

Three large oaks in the centre of the park were very poor in lichens, but dead leaves on the ground suggest that at least one of them is a non-native species.

Sizeable dead wood is local, generally comprising only some oak stumps and some fallen branches, but some fallen oaks are present. The flora on wood is currently fairly limited, but should improve as the fallen trunks and branches age. *Cladonia parasitica* was confined to oak wood. A dead branch attached to an oak had *Calicium glaucellum* (Figs. 5, 12). Stumps and fallen branches have *Cladonia coniocraea*, *Cladonia polydactyla* and rarely *Micarea prasina* agg. *Imshaugia aleurites* occurred only on one fallen oak. Branches lying near the ground may not be very suitable for some lichens, either because they are too moist or they are too often visited by slugs. This means that large, intact dead trees, and dead attached branches are valuable. Dead wood of other species is usually too fast-decaying to be a really good substratum for lichens, although there is potential to support some species. Exposed wood on a branch of an old hornbeam supported the only record of *Chaenotheca hispidula* (Figs. 9, 11).

Oak twigs generally support lichens that indicative relatively low-nutrient conditions, with nitrogen-sensitive species including *Evernia prunastri* (frequent), *Hypogymnia physodes* and *H. tubulosa* (occasional in small quantities), *Parmelia saxatilis* (occasional), *Parmelia sulcata* (frequent) and occasional *Usnea* species, usually in small quantity, but sometimes well-developed. Nitrogen-tolerant species tend to be sparse on oak twigs, with *Lecidella elaeochroma* (occasional), *Physcia adscendens* and *P. tenella* (rare or sparse), *Punctelia subrudecta* (occasional) and *Xanthoria parietina* (occasional in small quantity). However, nitrogen-tolerant species are more frequent on the twigs of some trees with more base-rich bark, including ash and sycamore. At one locality, the lichens on oak twigs were recorded following a method designed to estimate the influence of nutrient-nitrogen, and the results indicate that the air is 'clean' in terms of nitrogen influence (Appendix 1).

On trunks, *Diploicia canescens* is an indicator of elevated nutrient levels, and at other sites is generally typical of well-lit oaks in pasture, where there are elevated ammonia levels, or where dust is blown onto the trunk. Surprisingly, it is occasional in the woodland at east end of the site, elsewhere only on the ancient oak near the house. There may be some nutrient influence here from a nearby pasture.

The park fence is non-functional in several places, and the park is said to be grazed only by wild red deer. Grazing is sufficient to hold brambles on the ground in check, though there are spectacular high brakes covering many shrubs (Fig. 13). Holly seedlings are abundant in many areas. In a few places holly trees are shading oaks (Fig. 7), but currently holly is not a problem, due to grazing. Hawthorn is numerous, and some areas have presumably self-sown birch groves.

In general, ivy was uncommon on trunks, but young ivy shoots were seen beginning to climb oak trunks in several places (Fig. 4), suggesting that this is a recent phenomenon.

## Discussion

Alfoxton Park has a number of notable species and is clearly a valuable site for lichens, though far from being in the top rank of sites in Somerset. Crustose species of dry bark are fairly well-represented, including frequent *Cresponea premnea*, also *Inoderma subabietinum*, *Lecanographa lyncea*, *Snippocia nivea* and three species of *Chaenotheca*. Leafy old-forest lichens are absent, and the best occurrences of such species are in the west of the county (Wolseley *et al.* 2018, Fig. 2).

The Southern Oceanic Lichen Index (SOWI) is one of the indices designed to estimate the likelihood of age and ecological continuity of a woodland site. The species included in SOWI are those which are slow to colonise new sites or which require niches found only on old trees; thus they tend to occur where there has been a continuous presence of mature trees for several hundred years, and are lost where there is clear-felling. The total of 13 SOWI species for Alfoxton Park is rather modest, and is below the threshold of 30 suggested for consideration for SSSI status by Sanderson *et al.* (2018).

Wolseley *et al.* (2018) mention the following records for ‘Alfoxton’, though they are not necessarily within the park:

<i>Chaenotheca furfuracea</i>	Alfoxton Wood
<i>Chaenotheca hispidula</i>	Alfoxton
<i>Chaenotheca trichialis</i>	Alfoxton Park
<i>Lecanographa lyncea</i>	Alfoxton Park
<i>Lobaria pulmonaria</i>	Alfoxton Wood, Francis Rose, 1971-1982
<i>Mycoblastus caesius</i>	Alfoxton Park
<i>Opegrapha corticola</i>	Alfoxton, <i>Quercus</i> and <i>Ilex</i> .
<i>Usnea rubicunda</i>	Alfoxton Park

Some of these species were recorded in the present survey. The most significant species in the list, *Lobaria pulmonaria*, was probably recorded outside the park, and the record is old.

The maintenance of the lichen interest depends on maintaining good light levels and avoiding excessive nutrient levels. In the long term a new generation of trees should be provided. No oak planting was noted, and few young oaks were seen. A new generation to succeed the old oaks seems largely absent. Some parts of the park have an attractive ‘wildwood’ appearance, with thickets of hawthorn and brakes of brambles; it is tempting to think that these could act as nurseries for self-sown acorns, as happens at some sites, but this phenomenon was not seen. Hawthorn could potentially cause some shading to oaks, but this is not currently a problem, and hawthorns seem not to cluster near the oak trunks.

Over time, it would be an advantage for oak to be encouraged, and exotic species such as chestnut and pine discouraged. Species other than oak provide variety, and *Opegrapha prosodea* was only seen on sycamore. Although sycamore is non-native, its base-rich bark supports species not found on oak, and provides an alternative to ash, which may be lost through disease.

Continued grazing is essential to prevent excessive growth of young trees, which would shade out the trunks of mature oaks and lead to loss of notable lichens. Holly would become a significant problem in a couple of decades, as seedlings are already so numerous in some areas that the species would expand rapidly. This species may have become more vigorous as a result of climate change, and in many sites it causes serious shading to oak trunks, forming a shade-tolerant thicket, often close to the trunk.

Ivy has the potential to smother lichens on the trunk, and should be removed frequently. This species also seems to have become more vigorous in the last few decades. If ivy is needed for its value for some wildlife then trees other than oak should be allowed to become invaded.

The lichens on oak twigs in the centre of the park suggest that the influence of ammonia is low. The park benefits from the presence of extensive areas of unenclosed hill pasture and woodland on its west and south sides, where fertiliser is probably never applied, and where stocking levels are low.

## References

- Sanderson, N. A., Wilkins, T.C., Bosanquet, S.D.S and Genney, D.R. (2018) *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 13 Lichens and associated microfungi*. Joint Nature Conservation Committee, Peterborough.
- Wolseley, P.A., Coppins, B.J. & Coppins, A.M. (2018) Somerset Lichens and Lichenicolous Fungi. An Overview and Annotated Checklist. *The Proceedings of the Somerset Archaeological and Natural History Society* **161**: 235-311.

Table 1. Species recorded.

<i>Andreiomyces obtusaticus</i>	Rare. 30 Cs.
<i>Anisomeridium biforme</i>	Rare. 8 Ap,
<i>Arthonia didyma</i>	4 Ca,
<i>Arthonia pruinata</i>	8 Ap, 54 Q, 57 Q.
<i>Arthonia radiata</i>	65 Q br, 74 Cm br, 75 Cm br, 76 Cm br.
<i>Arthonia spadicea</i>	Occasional. 4 Ca.
<i>Arthopyrenia analepta</i>	12 B, 13 Cm br, 75 Cm br, 76 Cm br.
<i>Arthopyrenia salicis</i>	4 Ca.
<i>Bacidia rubella</i>	9 Ap.
<i>Calicium glaucellum</i>	Rare. 22 Q dry wood of attached dead branch.
<i>Catillaria nigroclavata</i>	13 Cm br.
<i>Chaenotheca ferruginea</i>	Very rare. 11 Q r.
<i>Chaenotheca hispidula</i>	Rare. 13 Cb dry wood on old branch reaching to ground.
<i>Chaenotheca stemonea</i>	Rare on very dry oak bark. 3 Qp r, 64 Q o, 77 Q vr. Sterile.
<i>Chaenotheca trichialis</i>	Occasional on old oaks in dry bark crevices. 3 Qp, 16 Qp ancient pollard ro, 22 Q ro, 23 Q o, 64 Q r.
<i>Chrysothrix candelaris</i>	Occasional on dry oak bark, in small quantities, never very conspicuous. 1 Qp, 2 Q, 3 Q, 64 Q.
<i>Chrysothrix flavovirens</i>	Occasional in small quantities on dry acidic bark and wood. 2 Q, 11 Q r, 22 Q dead br rare, 62 Q fallen dead tree, 69 Q, 70 Larix decidua.
<i>Cladonia coniocraea</i>	Occasional on oak wood. 22 Q fallen branch.
<i>Cladonia digitata</i>	31 Q unshaded stump.
<i>Cladonia ochrochlora</i>	31 Q unshaded stump.
<i>Cladonia parasitica</i>	Very local on old oak wood. 31 Q unshaded stump, 35 Q stump o, 41 Q stump, 63 Q dead fallen trunk, 78 Q wood.
<i>Cladonia polydactyla</i>	Occasional on oak wood. 22 Q fallen branch, 26 Cs, 28 dead pine, 31 Q unshaded stump, 62 Q fallen dead tree, 63 Q dead fallen trunk, 68 Q, 78 Q wood.
<i>Cladonia portentosa</i>	Very rare. 31 Q unshaded stump.
<i>Cladonia ramulosa</i>	31 Q unshaded stump.
<i>Cliostomum griffithii</i>	Occasional in small quantity. 11 Q, 14 Cb.
<i>Cresponea premnea</i>	Frequent on old oak trunks and and often abundant, occasionally on other trees, and then usually in small quantity. 1 Qp f, 2 Q f, 3 Qp a, 6 Q smallish tree, 6 Ap, 11 Q, 16 Qp ancient pollard f, 17 Fe r, 22 Q f, 23 Q, 24 Cs r, 27 Q a, 30 Cs o, 33 Q a, 36 Q, 37 Q f, 38 Q, 39 Q, 40 Q, 42 Q, 43 Q, 45 Q, 50 Q f, 51 Q, 52 Q, 53 Q, 54 Q, 56 Q, 57 Q, 58 Q, 59 Q, 65 Q r, 69 Q, 71 Ap r, 77 Q.
<i>Dimerella pineti</i>	Rare. 70 Larix decidua.
<i>Diploicia canescens</i>	Occasional. 9 Ap, 16 Qp ancient pollard well-lit base on S side, 42 Q r, 45 Q a, 50 Q f, 51 Q, 52 Q, 56 Q, 57 Q, 77 Q.
<i>Enterographa crassa</i>	Occasional on smooth bark. 7 Ap, 9 Ap r, 18 Ah, 21 Fe, 33 Q, 37 Q r, 38 Q, 43 Q, 50 Q, 61 Ap.
<i>Evernia prunastri</i>	Frequent on twigs and branches. 6 Q br, 13 Cm br, 23 Q br, 39 Q br f, 44 Q br f, 65 Q br, 67 Q br, 69 Q br f, 74 Cm br.



<i>Flavoparmelia caperata</i>	Occasional to frequent on trunks and branches. 1 Qp f, 6 Q br, 8 Ap br, 14 Cb, 39 Q, 44 Q br, 65 Q br.
<i>Fuscidea lightfootii</i>	6 Q br, 44 Q br, 65 Q br.
<i>Graphina anguina</i>	15 Fe.
<i>Graphis elegans</i>	13 Cm br, 67 Q br.
<i>Graphis scripta</i>	Occasional on smooth bark. 4 Ca.
<i>Hypocenomyce scalaris</i>	Rare. 22 Q dry wood of attached dead br rare, 63 Q dead fallen trunk r.
<i>Hypogymnia physodes</i>	Rare and in small quantities on twigs and branches. 6 Q br, 13 Cm br, 22 Q dead br r, 62 Q fallen dead tree, 65 Q br, 12 B br.
<i>Hypogymnia tubulosa</i>	Rare and in small quantities on twigs and branches. 6 Q br, 65 Q br, 66 Q br, 12 B br.
<i>Hypotrachyna afrorevoluta</i>	Occasional on twigs and branches. 6 Q br, 8 Ap br, 13 Cm br, 23 Q br, 65 Q br, 67 Q br.
<i>Hypotrachyna revoluta</i>	Occasional on twigs. 6 Q br, 13 Cm br f, 66 Q br, 74 Cm br.
<i>Imshaugia aleurites</i>	Rare. 62 Q wood of fallen dead tree ro.
<i>Inoderma subabietinum</i>	Rare. 16 Qp ancient pollard recess at base on NE side, 23 Q recess on SE side.
<i>Japewiella tavaresiana</i>	67 Q br.
<i>Lecanactis abietina</i>	On dry bark, occasional. 3 Q, 11 Q, 22 Q, 23 Q, 26 Cs young tree, 30 Cs, 38 Q, 69 Q, 71 Ap.
<i>Lecania naegelii</i>	74 Cm twig, 76 Cm twig.
<i>Lecanographa lyncea</i>	Rare. 16 Qp ancient pollard lf, 45 Q r, 50 Q lf, 58 Q, 77 Q.
<i>Lecanora argentata</i>	Occasional. 6 Q br, 15 Fe, 17 Fe, 46 Fe.
<i>Lecanora carpineae</i>	6 Q br.
<i>Lecanora hybocarpa</i>	13 Cm twigs, 15 Fe, 44 Q br.
<i>Lecidella elaeochroma</i>	6 Q br, 13 Cm br, 15 Fe, 39 Q br, 74 Cm br, 75 Cm br.
<i>Lepraria finkii</i>	4 Ca, 8 Ap, 12 B r, 14 Cb.
<i>Lepraria incana</i>	Frequent on dry acidic bark of oaks. 1 Qp, 3 Qp, 11 Q, 22 Q.
<i>Lepraria umbricola</i>	Rare. 19 Cs abundant on exposed wood of large tree.
<i>Melanelixia glabrata</i>	Rare. 20 Fe r.
<i>Melanelixia subaurifera</i>	Frequent on twigs and branches. 39 Q br, 44 Q br, 65 Q br, 66 Q br, 74 Cm br, 76 Cm br.
<i>Micarea doliiformis</i>	Rare. 25 Cs large tree, 69 Q large tree.
<i>Micarea prasina s.l.</i>	Rare. 28 dead fallen pine, 29 Q stump, 63 Q dead fallen trunk.
<i>Mycoporum antecellens</i>	75 Cm twig.
<i>Normandina pulchella</i>	Rare. 4 Ca, 12 B, 73 Ap.
<i>Opegrapha corticola</i>	Rare. 16 Qp ancient pollard NE side, 61 Ap lf on large tree.
<i>Opegrapha herbarum</i>	4 Ca, 5 Ca, 6 Q, 7 Ap, 12 B.
<i>Opegrapha ochrocheila</i>	Rare. 12 B exposed wood.
<i>Opegrapha prosodea</i>	61 Ap.
<i>Opegrapha vermicellifera</i>	18 Ah,
<i>Opegrapha vulgata</i>	Occasional. 7 Ap, 71 Ap, 73 Ap.
<i>Opegrapha xerica</i>	Rare. 16 Qp recess at base of ancient pollard on NE side.
<i>Parmelia saxatilis s.l.</i>	Occasional. 46 Fe,
<i>Parmelia sulcata</i>	Frequent. 6 Q br, 8 Ap br, 13 Cm br, 44 Q br, 69 Q br, 74 Cm br, 76 Cm br.

<i>Parmotrema perlatum</i>	Occasional on trunks and branches in small quantities. 1 Qp r, 12 B br, 13 Cm br, 44 Q br r, 47 Fe, 74 Cm br.
<i>Pertusaria albescens</i> var. <i>albescens</i>	43 Q, 46 Fe,
<i>Pertusaria albescens</i> var. <i>corallina</i>	7 Ap, 9 Ap, 20 Fe, 39 Q, 47 Fe, 73 Ap.
<i>Pertusaria amara</i>	8 Ap br.
<i>Pertusaria hemisphaerica</i>	Local on oaks at east end of site. 2 Q, 42 Q, 43 Q, 54 Q, 60 Fe.
<i>Pertusaria hymenea</i>	2 Q, 4 Ca, 8 Ap, 21 Fe, 38 Q, 43 Q, 50 Q, 60 Q, 73 Ap.
<i>Pertusaria leioplaca</i>	Rare. 24 Cs, 32 Fs young tree, 74 Cm br.
<i>Pertusaria pertusa</i>	Locally frequent. 1 Qp, 2 Q, 7 Ap, 17 Fe, 20 Fe, 39 Q, 60 Fe, 73 Ap.
<i>Phaeographis smithii</i>	6 Q br, 13 Cm br, 15 Fe, 39 Q br, 74 Cm br, 75 Cm br.
<i>Phaeophyscia orbicularis</i>	8 Ap br, 76 Cm br r.
<i>Phlyctis argena</i>	4 Ca, 46 Fe, 60 Fe.
<i>Physcia adscendens</i>	44 Q br r, 76 Cm br.
<i>Physcia aipolia</i>	Rare. 6 Q br, 44 Q br, 75 Cm br,
<i>Physcia stellaris</i>	67 Q br.
<i>Physcia tenella</i>	Rare. 13 Cm br, 39 Q br o, 44 Q br o, 74 Cm br, 76 Cm br.
<i>Platismatia glauca</i>	Rare. 13 Cm br, 66 Q br.
<i>Porina borrieri</i>	18 Ah, 73 Ap.
<i>Porina byssophila</i>	74 Cm twig.
<i>Psoroglaena stigonemoides</i>	10 elder, 21 elder.
<i>Punctelia jeckeri</i>	39 Q br, 44 Q br, 74 Cm br.
<i>Punctelia subrudecta</i>	6 Q br, 8 Ap br, 21 Fe, 46 Fe, 60 Fe, 66 Q br.
<i>Pyrenula macrocarpa</i>	Rare on smooth bark. 5 Ca.
<i>Pyrrhospora quernei</i>	1 Qp, 17 Fe c.fr., 20 Fe.
<i>Ramalina farinacea</i>	8 Ap br, 13 Cm br, 23 Q br, 39 Q br, 66 Q br, 69 Q br f.
<i>Ramalina fastigiata</i>	Occasional on twigs. 6 Q br, 23 Q br, 39 Q br, 74 Cm br, 76 Cm br.
<i>Rinodina roboris</i>	Rare. 16 Qp ancient pollard lf, 45 Q, 50 Q.
<i>Schismatomma cretaceum</i>	Rare and local on rain-sheltered bark of oaks. 50 Q, 52 Q r, 77 Q good patch E side of large tree.
<i>Schismatomma decolorans</i>	Frequent on old oaks on dry bark, occasional on other trees. 1 Qp, 2 Q, 6 Q, 7 Ap, 8 Ap, 14 Cb, 22 Q, 27 Q, 32 Fs, 43 Q, 45 Q.
<i>Snippocia nivea</i>	Local on dry bark of oaks at east end of site. 2 Q, 43 Q, 49 Q, 51 Q, 52 Q, 53 Q, 58 Q.
<i>Thelotrema lepadinum</i>	Rare. 4 Ca, 24 Cs ro, 26 Cs young tree, 33 Q, 36 Q, 39 Q, 40 Q, 42 Q, 43 Q, 51 Q, 53 Q lf on base, 67 Q.
<i>Trapeliopsis flexuosa</i>	41 Q stump, 63 Q dead fallen trunk.
<i>Trapeliopsis granulosa</i>	31 Q unshaded stump.
<i>Usnea florida</i>	66 Q br.
<i>Usnea subfloridana</i>	Occasional on twigs, sometimes small and stunted but often well-developed. 6 Q br r and small, 13 Cm br rare but thallus well-developed, 23 Q br, 65 Q br, 66 Q br.
<i>Usnea wasmuthii</i>	23 Q br, 66 Q br, 69 Q br.
<i>Xanthoria parietina</i>	6 Q br o, 8 Ap br, 39 Q br r, 44 Q br o, 74 Cm br, 76 Cm br.



Ah = *Aesculus hippocastanum* (horse chestnut), Ap = *Acer pseudoplatanus* (sycamore),  
 B = *Betula* (birch), Cb = *Carpinus betulus* (hornbeam), Cm = *Crataegus monogyna* (hawthorn),  
 Cs = *Castanea sativa* (sweet chestnut), Fe = *Fraxinus excelsior* (ash), Q = *Quercus* (oak)  
 br = branch or twig, f = frequent, o = occasional, r = rare.

Table 2. Notable species.

	RDB	NR/NS	IR	RDB/Nb	SOWI
<i>Opegrapha prosodea</i>	NT	NS	IR	NT	SOWI
<i>Usnea florida</i>	NT			NT	SOWI
<i>Chaenotheca stemonea</i>		NS		Nb	SOWI
<i>Opegrapha corticola</i>			IR	Nb	SOWI
<i>Snippocia nivea</i>			IR	Nb	SOWI
<i>Micarea doliiformis</i>		NS		Nb	
<i>Opegrapha xerica</i>		NS		Nb	
<i>Porina borrieri</i>		NS		Nb	
<i>Cresponea premnea</i>			IR	Nb	SOWI
<i>Inoderma subabietinum</i>			IR	Nb	SOWI
<i>Lecanographa lyncea</i>			IR	Nb	SOWI
<i>Rinodina roboris</i>			IR	Nb	
<i>Chaenotheca trichialis</i>					SOWI
<i>Chaenotheca hispidula</i>					SOWI
<i>Cladonia parasitica</i>					SOWI
<i>Mycoporum antecellens</i>					SOWI
<i>Thelotrema lepadinum</i>					SOWI

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SOWI = Southern Oceanic Woodland Index, NR = Nationally Rare,  
 NS = Nationally Scarce, IR = International Responsibility, Nb = Notable  
 RDB/Nb = Red Data Book species or Notable.  
 (see Sanderson et al. 2018 for details).

Table 3. Localities where notes or records were made.

number	GIS reading	quoted accuracy ( $\pm$ m)	date
1	ST15094.41318	3	2022 03 29
2	ST15116.41306	3	2022 03 29
3	ST15060.41106	3	2022 03 29
4	ST15036.41100	3	2022 03 29
5	ST15017.41093	3	2022 03 29

6	ST14956.41122	4	2022 03 29
7	ST14943.41135	3	2022 03 29
8	ST14939.41138	3	2022 03 29
9	ST14933.41141	3	2022 03 29
10	ST14935.41101	3	2022 03 29
11	ST14783.41113	3	2022 03 29
12	ST14753.41116	3	2022 03 29
13	ST14741.41153	3	2022 03 29
14	ST14728.41167	6	2022 03 29
15	ST14743.41261	4	2022 03 29
16	ST14706.41356	6	2022 03 29
17	ST14708.41371	5	2022 03 29
18	ST14694.41377	4	2022 03 29
19	ST14709.41406	5	2022 03 29
20	ST14702.41356	5	2022 03 29
21	ST14694.41338	3	2022 03 29
22	ST14685.41275	3	2022 03 29
23	ST14680.41268	3	2022 03 29
24	ST14670.41271	4	2022 03 29
25	ST14662.41316	5	2022 03 29
26	ST14642.41322	6	2022 03 29
27	ST14651.41385	6	2022 03 29
28	ST14652.41395	3	2022 03 29
29	ST14634.41409	4	2022 03 29
30	ST14602.41411	6	2022 03 29
31	ST15026.41354	5	2022 03 30
32	ST15026.41349	5	2022 03 30
33	ST15032.41333	4	2022 03 30
34	ST15037.41331	4	2022 03 30
35	ST15027.41331	8	2022 03 30
36	ST15046.41340	10	2022 03 30
37	ST15052.41336	4	2022 03 30
38	ST15062.41335	5	2022 03 30
39	ST15059.41337	3	2022 03 30
40	ST15080.41339	5	2022 03 30
41	ST15081.41323	3	2022 03 30
42	ST15082.41315	5	2022 03 30
43	ST15086.41305	3	2022 03 30
44	ST15079.41295	10	2022 03 30
45	ST15093.41253	4	2022 03 30
46	ST15107.41263	4	2022 03 30
47	ST15119.41258	4	2022 03 30
48	ST15100.41230	6	2022 03 30
49	ST15109.41286	4	2022 03 30
50	ST15066.41264	3	2022 03 30
51	ST15051.41279	4	2022 03 30
52	ST15044.41285	3	2022 03 30
53	ST15031.41299	6	2022 03 30

54	ST15031.41313	6	2022 03 30
55	ST15020.41296	4	2022 03 30
56	ST15019.41295	3	2022 03 30
57	ST15020.41287	3	2022 03 30
58	ST15015.41276	3	2022 03 30
59	ST15005.41272	4	2022 03 30
60	ST14992.41262	5	2022 03 30
61	ST14959.41257	5	2022 03 30
62	ST14961.41284	3	2022 03 30
63	ST14934.41262	3	2022 03 30
64	ST14826.41222	4	2022 03 30
65	ST14831.41202	3	2022 03 30
66	ST14838.41178	3	2022 03 30
67	ST14816.41161		2022 03 30
68	ST14853.41136	5	2022 03 30
69	ST14772.41107	6	2022 03 30
70	ST14644.41185	4	2022 03 30
71	ST14685.41143	8	2022 03 30
72	near Locality 12		2022 03 30
73	ST14935.41143	3	2022 03 30
74	ST15030.41163	3	2022 03 30
75	ST15040.41165	4	2022 03 30
76	ST15050.41185	5	2022 03 30
77	ST15064.41206	3	2022 03 30
78	ST15083.41214	3	2022 03 30

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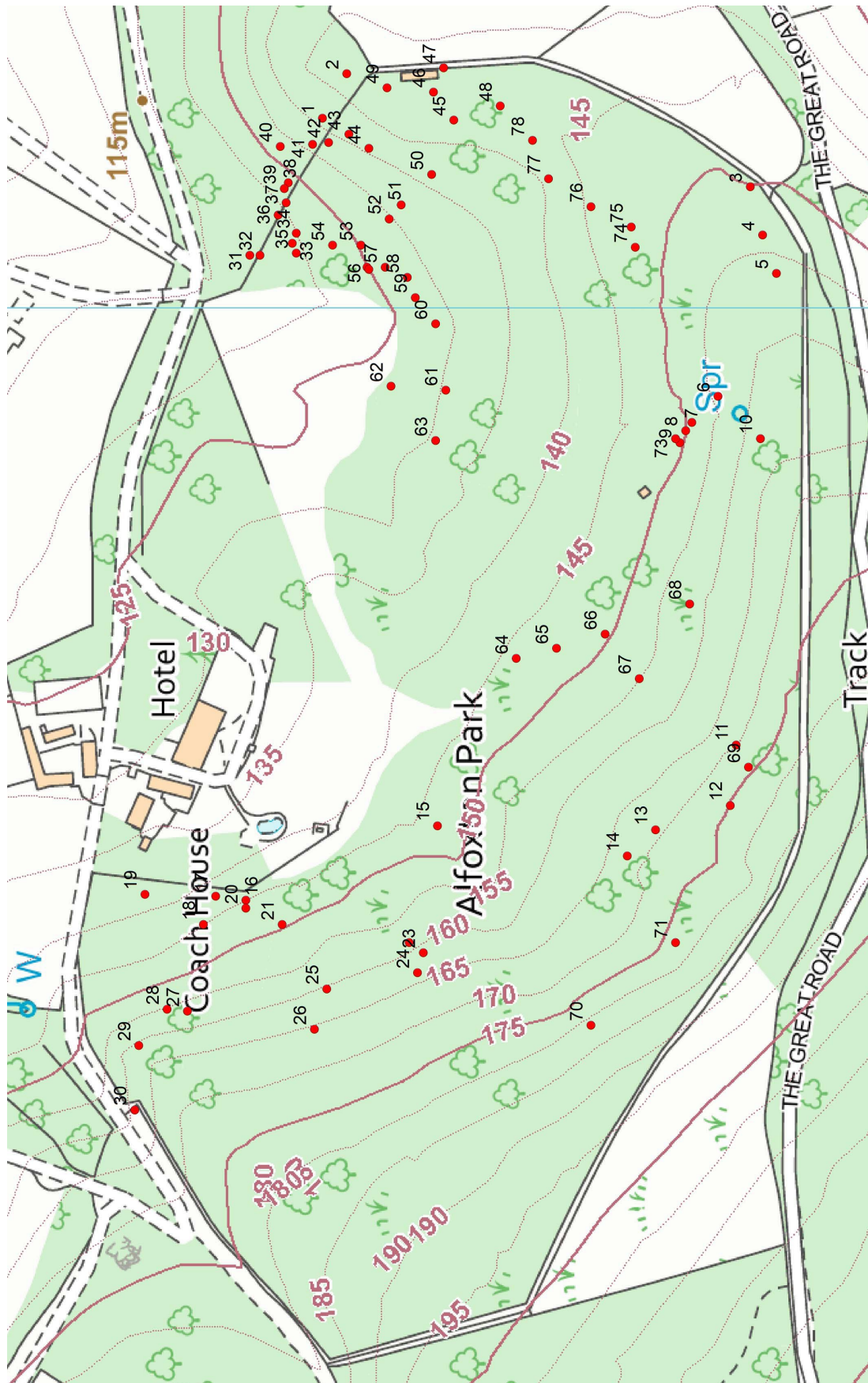


Fig. 1. Localities where records were made at Alfoxton Park. Some localities at the eastern end of the park are shown outside the boundary, but in the field they were on the west side of the fence.





Fig. 2. Oak with *Chaenotheca trichialis*. Locality 3.



Fig. 3. Ancient oak with *Cresponea premnea*, *Inoderma subabietinum*, *Lecanographa lyncea*, *Opegrapha corticola*, *O. xerica* and *Rinodina roboris*. Locality 16.





Fig. 4. *Inoderma subabietinum* (white) in recess at base of ancient oak. Young ivy stems are beginning to invade. Locality 16.



Fig. 5. *Calicium glaucellum* occurs on the wood of the dead attached branch of this oak. Locality 22.





Fig.6. Old oaks with surrounding hawthorn. Locality 22/23.



Fig. 7. Holly shading an oak trunk. Locality 33.





Fig. 8. Dead oak. The slowly rotting wood is a potentially valuable habitat for lichens, though this tree is still too recently fallen to be very rich. Locality 63.



Fig. 9. Dead wood on the low branch of this hornbeam supports *Chaenotheca hispidula*. Locality 14.





Fig. 10. Open woodland. Locality 40.



Fig. 11. *Chaenotheca hispidula*, showing the stalked fruiting body with bright yellow-green frosting, and the brown mass of dry spores. Scale = 0.5 mm.





Fig. 12. *Calicium glaucellum*, showing the stalked fruiting body with a tall black mass of dry spores. Scale = 0.5 mm.



Fig. 13. Tall shrubs covered by brambles are a feature of the park.

### Appendix. Records of lichens and bryophytes on five oak twigs in group of three oaks.

Site: Afoxton Park							Location:		Tree 65, 66, 67								
Map ref.: ST14831.41202, ST14838.41178, ST14816.41161							species: Quercus										
Twig:		1			2			3			4			5		to t	av
Zone:	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1		
<i>Evernia prunastri</i>	r			o	o			o		r	o	o	r	r		9	S
<i>Parmelia sulcata</i>		r		o	o	o		o	f	r	o	o				9	S
<i>Fuscidea lightfootii</i>			r	r		r					r		r	r	r	7	
<i>Melanelixia subaurifera</i>	r			o	r		r			r	o		r			7	
<i>Hypnum andoi</i>			r	r	r	o			o							5	
<i>Usnea subfloridana</i>			r	r	f	o		o								5	S
<i>Flavoparmelia caperata</i>			r		o				r				r			4	S
<i>Graphis elegans</i>		o										r		o	f	4	S
<i>Hypotrachyna afrorevoluta</i>	r												r	r	r	4	
<i>Frullania dilatata</i>											r			o	f	3	
<i>Hypogymnia physodes</i>			o		o			o								3	S
<i>Arthonia radiata</i>		r	r													2	T
<i>Cyrtidula quercus</i>	f						o									2	
<i>Hypogymnia tubulosa</i>			o			o										2	S
<i>Hypotrachyna revoluta</i>				r	r											2	
<i>Lecanora hybocarpa</i>													r	r		2	
<i>Microlejeunea ulicina</i>					r									r		2	
<i>Physcia aipolia</i>		r		r												2	
<i>Physcia tenella</i>							r			r						2	T
<i>Ramalina farinacea</i>					r		r									2	
<i>Ulota bruchii/crispa</i>			r												o	2	
<i>Arthopyrenia analepta</i>		r													r	2	
<i>Japewiella tavaresiana</i>														r		1	
<i>Lecanora carpinea</i>														r		1	
<i>Metzgeria furcata</i>														r		1	
<i>Metzgeria violacea</i>			r													1	
<i>Parmelia saxatilis</i>						r										1	S
<i>Phaeographis smithii</i>		r														1	
<i>Physcia stellaris</i>														r		1	
<i>Punctelia subrudecta</i>				r												1	
<i>Usnea florida</i>						r										1	S
<i>Usnea wasmuthii</i>									r							1	S
Sensitive:	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	2.8
Tolerant:	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	4	0.8
Total lichen species:																	
32																	
LIS:	2.00																
NAQI:	0.35 (clean)																
S = N-sensitive species (green highlight), T = N-tolerant species (pink highlight).																	
A = acidophyte, N = nitrophyte. L <sub>AN</sub> value shown but not calculation.																	
a: abundant, f: frequent, o: occasional, r: rare, vr: very rare.																	

On each twig, lichens and bryophytes were recorded in each of three zones, 0 to 50 cm from the tip, 50-100 cm, and 100-150 cm. Only the nitrogen-sensitive and nitrogen-tolerant lichens need be recorded, but all species were recorded above. The Lichen Indicator Score (LIS) is the average number of sensitive minus the average number of tolerant species. This can be converted to the N Air Quality Index (NAQI) which is based on a combination of ammonia and  $\text{NH}_2$ . According to the APIS website an NAQI of 0.35 suggests that the air is 'clean'.