A Lichen Survey of Pixton Park Surrounds, and the Attempted Transplantation of Fuscopannaria mediterranea 2018

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Summary

Mature and veteran trees in the surrounds of Pixton Park were surveyed for lichens in five areas. In total 105 species were recorded, the SOWI score was 15, there were 2 Near Threatened species, and 8 Notable species. A few species were additional to the list for Pixton Park, of which the only significant one was *Chaenotheca stemonea* (a SOWI species, and Notable). The following significant lichen assemblages were present: Base Rich Bark on Veteran Trees, mainly represented by *Bacidia biatorina* and a few others; Dry Bark and Lignum on Veteran Oaks and Lignum on Fallen and Standing Dead Oaks, represented mainly by *Cresponea premnea*; and Sheltered Twigs and Branches in More Open Areas, represented by *Usnea articulata*. Of the five areas surveyed, Area 1 has the most lichen interest, Area 2 had sparse interest, Area 3 scattered interest; Area 4 had only two significant trees, and is distant from the main area of the Park. Area 5 had only low interest.

It is recommended that at least parts of Area 1 (adjacent to the northern edge of Pixton Park) be considered as part of a Pixton Park SSSI; the remainder of Area 1, and parts of Area 3, may warrant inclusion, and would increase the number of mature and veteran trees, a factor which is crucial to the long-term viability of the Pixton Park lichen assemblage. Area 4 is not viable on its own, and is too far from the main park. Area 5 has no special value.

Management issues in the park surrounds include excessive growth of ivy and holly, and concentration of dung by feeding of stock near to trees.

Transplantation of *Fuscopannaria mediterranea* from a dead oak to a nearby living oak in Pixton Park was attempted.

Introduction

The lichens of Pixton Park were surveyed by Wolseley & O'Dare (1988) and in more detail by Sanderson (2017a). Sanderson considered that the flora was of international significance, and the site was worthy of SSSI status. An ancient tree survey showed that mature and veteran trees occurred in areas outside the 2017 survey. The present survey was undertaken to assess the value of these surrounding areas and to consider their relationship to the 2017 survey area.

The 2017 survey found the rare *Fuscopannaria mediterranea* to be confined to a single oak, which had recently died. Since the likelihood of this species colonising another tree is extremely low, an attempt was made to transplant it to another tree.

Methods

Pixton Park is immediately south-west of Dulverton, in the vice-county of South Somerset (V.C. 5). The areas surveyed in 2018 are all within hectad SS92 (Fig 1).

The park surrounds were surveyed on 14-16 March 2018, with a short visit also on 28 March. The weather was dry and overcast apart from rain on the afternoon of 14 March. Survey took place in five areas suggested by Natural England (Fig. 1). Locations were recorded as latitude and longitude using a hand-held GPS, corrected by reference to satellite images using http://itouchmap.com/latlong.html, and converted to British National Grid using http://gridreferencefinder.com/batchConvert/batchConvert.php. Tree locations were cross- referenced as far as possible to an veteran-tree survey of the surrounds (Table 5).

Methods used for the attempted transplant of *Fuscopannaria* are given in Appendix 1.

Conservation grading of species, and indices of ecological continuity follow Sanderson (2017a), which are in turn based on Sanderson (2017b and 2018).

Results

Overall, 105 species were recorded (Table 1). The SOWI indicator score was 15 (below the threshold for an important site), the URI score was low (Tables 2, 3). There were 2 Near Threatened species (*Heterodermia obscurata* and *Usnea articulata*) and 8 Notable species (Tables 2, 3). Some Notable or 'local species of ecological significance' (see below) species reported from the surrounds have few occurrences in the Park, so that the surrounds are a significant addition to the population (*Chaenotheca brunneola*, *C. trichialis*, *Chaenothecopsis nigra*, *Mycoblimbia epixanthoides*, *Opegrapha corticola*; Table 4).

Area 1

Area 1 has only scattered trees, but the eastern section (trees 1/1 to 1/12) has some feel of wood-pasture, with sparse old-forest species including *Bacidia biatorina*, *Catinaria atropurpurea*, *Cresponea premnea*, *Mycobilimbia epixanthoides*, *Pachyphiale carneola* and *Thelotrema lepadinum* (Figs. 3–12). There is some base

rich bark, as indicated by mosses including *Homalothecium sericeum*, *Hypnum resupinatum* and *Zygodon rupestris*, but lichens associated with this are sparse. The dry sides of trunks often have abundant *Schismatomma decolorans*, and some acid bark has *Lepraria incana* and *Chrysothrix flavovirens*. Twigs indicate that ammonia levels are still relatively low; acidophytes including *Evernia* and *Usnea* are at least occasional, and nitrophytes are sparse on living twigs, represented by *Physcia tenella* and *Xanthoria parietina*. Some trunks are badly infested with ivy, and others have holly growing adjacent, which will cause excessive shading when older (Fig. 19). Trunks incorporated into hedges are either poor in lichens or at risk, as they often have much ivy, and are out of reach of grazing animals (Figs. 13, 17). Feeding of cattle has taken place at several points, always near to trees (for shelter, presumably), and here the ground is trampled into mud and there is a concentration of dung, a source of ammonia which could affect the lichens on the nearby trees (Fig. 9).

The trees in the north and north-west part of the area are mostly associated with existing or former boundaries, and have fewer species of interest overall. However, tree 1/16 in a field corner adjacent to a housing estate had a little sterile *Chaenotheca stemonea* (an old-forest species, and an addition to the Pixton list), with *Chaenothecopsis nigra* associated with it (only reported from one tree in the main Park) (Fig. 16). Tree 1/23 is a fine hollow ash, but with no significant species (Fig. 23). Trees 1/21 to 1/24 appear to be on the line of a demolished hedgebank.

Area 2

This has sparse trees, and some of these are not of great size (Figs. 25–27). There is some *Cresponea premnea* and others, but the flora is more reminiscent of field trees rather than wood pasture. Possibly they also need to be older. *Usnea articulata* occurs in the canopy of oaks.

Area 3

Area 3 does not precisely follow any modern boundaries but is drawn so as to include a number of mature and veteran trees, which are sometimes in pasture, but sometimes at the margins of adjacent woodland (Figs. 28–40). There is a thin scattering of old-forest species, namely *Bacidia biatorina* (occasional on oak), *Catinaria atropurpurea* (two ash), *Cresponea premnea* (several oak), *Pachyphiale carneola* (one ash), *Punctelia reddenda* (one oak) and *Thelotrema lepadinum*. *Heterodermia obscurata* occurred on the base of one oak in pasture. A fine old ash pollard (3/23, Fig. 37) on a hedgebank by a ruined farm unfortunately had nothing notable. Less common species of field trees rather than wood-pasture included *Parmelina tiliacea* and *Pertusaria coccodes*. Several oaks along a woodland margin have a negligible lichen flora due to dense shading from *Rhododendron*. (Figs. 35, 36). Ammonia levels seem to be low, with plenty of acidophytes/nitrogen-sensitive species on twigs, including *Evernia prunastri*, *Hypogymnia physodes*, *Usnea articulata* and *U. subfloridana* on oak twigs, and few nitrophytes/nitrogen-tolerant species.

Area 4

This comprises a strip of land between a steep east-facing slope, covered by young woodland, and the River Exe. Most of the area is former conifer plantation, now felled. Only three mature/veteran trees were seen, one dead and fallen on a steep slope, and another on the bank of the river, with a small amount of *Phyllopsora rosei* (4/3, Fig. 41). The third oak (4/4, Fig. 42) has lost its crown and is virtually dead; the trunk has

Arthonia vinosa, *Cresponea premnea*, *Opegrapha corticola* (reported from only one tree in the main Park) and *Schismatomma cretaceum*.

Area 5

This comprises only a few ash and an oak on a bank in pasture, with some blackthorn scrub, and a small area of fenced woodland with mainly very mossy hazel (Fig. 43). The only significant species was *Dimerella lutea* (a SOWI species) on hazel.

Discussion

Comparison of Pixton Park with the surrounding areas

Sanderson (2017a) discussed the value of Pixton Park in terms of various scores and lichen assemblages. A comparison of the park with its surrounds is shown in Tables 3 and 4.

Number of species: 192 species were recorded from the Park in 2017. A total of 105 were recorded in the surrounds. A small number of species are additional to the Park list: *Chaenotheca stemonea* (small quantity on one tree, a SOWI species and a Notable species), *Lepraria sylvicola*, *Lepraria umbricola*, *Parmelia ernstiae* (probably not distinguished from *P. saxatilis* in 2017) and *Usnea flammea*. Only the *Chaenotheca* is a significant addition.

Section 41: the Park has 5 Section 41 species (2017; 6 since 1986). One of these, *Usnea articulata*, was found in the surrounds. This appears to be a rather frequent species judging by fallen fragments, but it difficult to record consistently as it often occurs in the canopy.

RDB species: 9 species in 2017 (10 since 1986). In the surrounds only *Heterodermia obscurata* (Near Threatened, base of one oak) and *Usnea articulata* (Near Threatened) were found. *Phyllopsora rosei* (small quantity on Tree 4/3) is an English RDB species.

Notable species: 32 species in 2017 (36 since 1986). In the surrounds only six species were recorded: *Bacidia biatorina*, *Chaenothecopsis nigra*, *Cresponea premnea*, *Milospium graphideorum*, *Opegrapha corticola* and *Phyllopsora rosei*.

Systematically recorded species: Sanderson recorded a number of species systematically, including RDB species, a selection of Notable species, and a few non-scoring 'local species of ecological significance', including *Chaenotheca brunneola* and *Chaenotheca trichialis*. These species are thus the only significant species where the number of occurrences is recorded precisely. Sanderson's list included 29 species. Only 8 were found in the surrounds, together with *Chaenotheca stemonea* which was not recorded in 2017, but which would probably have been included in the 'systematically recorded' list if found (Table 4). All the systematically- recorded species were rare in the surrounds except for *Cresponea premnea* (13 trees) and *Usnea articulata*, which was not recorded systematically in 2018, but which appeared to be locally frequent. The distribution of systematically recorded species in the Park

andsurrounds is shown in Fig. 2, which gives an overall impression of the distribution of the lichen interest of the site.

SOWI: the Park scores 41 in 2017 on this index (45 based on all records since 1986). The surrounds adds one point to this score (from *Chaenotheca stemonea*). The surrounds score 15 on the index, below the threshold for an important site.

URI: the Park scores 9 on this index, and the surrounds only 3, a very low score.

The following assemblages were regarded as significant by Sanderson (2017a):
Base Rich Bark on Veteran Trees (*Lobarion pulmonariae*): in the surrounds this was weakly developed on some oaks, represented by six species: *Bacidia biatorina* (10 oaks), *Catinaria atropurpurea* (1 oak and 3 ash), *Mycoblimbia epixanthoides* (1 oak), *Opegrapha corticola* (1 oak), *Pachyphiale carneola* (2 oak, 1 ash), *Phyllopsora rosei* (1 oak).

Dry Bark and Lignum on Veteran Oaks and Lignum on Fallen and Standing Dead Oaks (*Lecanactidetum premneae* & *Calicietum abietinae*): a small number of species occurred in this assemblage in the surrounds: *Chaenotheca brunneola* (1 tree), *Chaenotheca trichialis* (3), *Chaenothecopsis nigra* (1), *Cladonia parasitica* (1), *Cresponea premnea* (13), *Milospium graphideorum* (1), *Schismatomma cretaceum* (1).

Sheltered Twigs and Branches in More Open Areas (*Usneetum articulato-floridae* var. *ceratinae*): two species in this assemblage were seen in the surrounds. *Heterodermia obscurata* was only recorded on the base of one oak, not the usual habitat for this species, but it may be present in canopies nearby. *Usnea articulata* was seen in several places, but mostly as thalli fallen from canopies. It seems likely to be rather frequent, and was also seen in woodland outside the survey area.

Wound Assemblages on Ancient Sycamores in Parkland (*Gyalectinetum carneoluteae*): rare in the Park, not present in the surrounds.

The 1987 survey of Wolseley and O'Dare (1988) did not report any additional significant species within the areas surveyed in 2018.

Thus the park surrounds contribute mainly Notable species to the wider area of Pixton Park, including one Notable species additional to the Park list (*Chaenotheca stemonea*). The distribution of significant species in the surrounds is not uniform: Area 1 has the highest SOWI score of the five Areas (Table 3), and the highest number of occurrences of 'systematically- recorded' species (Fig. 2, Table 4). In Figure 2 *Usnea articulata* is shown as a separate symbol, as systematic recording of this mainly canopy species was not possible.

The surrounds would not qualify for SSSI status on their own, but they need to be judged as a component of the total lichen interest at Pixton Park. Of the five Areas, Area 1 has the highest number of trees (all oaks) supporting 'systematically-recorded species'; it is also adjacent to the oaks along the northern edge of the area recorded by Sanderson in 2017 (Trees PX069 to PX078 in Area 3 of Sanderson, see Map 61, p. 145 in Sanderson 2017a.), and is thus an immediate continuation of that area of interest (Fig. 2). In Sanderson's map these trees are shown north of the field boundary, which is presumably due to inaccuracy of the waypoints. Area 2 in the surrounds adds relatively little to the Park, with sparse trees with *Cresponea premnea* (1 oak) and

some *Usnea articulata*. Area 3 has a few significant species, but these are scattered within three or four different parcels of land. Area 4 has only two significant trees, and one of these has broken up and probably has no future except as a source of dry lignum; this Area is also isolated from the main area of interest of the Park. Area 5 has little significance, and no veteran trees.

Sanderson (2017a, page 48) makes the point that '*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*'. This is a crucial point if epiphytic lichen sites are to genuinely have a future. The wider habitat has to be maintained, not merely a few trees which currently support notable species. To do otherwise is simply to preside over the slow decline which is a too-familiar feature of so many sites. With this in mind, there is reason to consider areas which currently have only scattered occurences of significant species, for inclusion within an SSSI boundary. In Area 3 for instance, the small number of significant trees in the southern part (3/8, 3/10, 3/12) are linked to the central parts of Pixton Park by a number of mature oaks (3/14 to 3/21). These currently have a poor flora largely because of dense shading by Rhododendron, but most are also relatively young and may not acquire significant species for many decades even if unshaded. Even oaks which are currently dying will provide a dry, dead wood habitat for the future.

Thus the park surrounds do not support a greater proportion of any significant species than the main Park (except for *Chaenotheca stemonea*), but they support veteran trees with scattered lichen interest. The surrounds are relevant to drawing a boundary which aims to preserve the lichen assemblage at Pixton Park, particularly when ensuring that there are sufficient numbers of mature trees to make the lichen interest viable for the future. It is suggested that the fields containing Trees 1/1 to 1/12, and Tree 1/20, in Area 1, should be considered as part of a proposed SSSI, as they form a compact continuation of the Park and support some significant species. Most of the trees here are not strictly associated with boundaries, and thus have a parkland aspect. The area with Trees 1/13 to 1/19 comprises three or four fields with oaks which are confined to boundaries or at least strictly marginal; including this area within an SSSI would preserve the veteran tree with *Chaenotheca stemonea*, although this species was in small quantity. The other trees in these fields currently have no significant species.

The remaining part of Area 1 comprises only four mature or veteran trees along a former boundary, with one occurrence of *Cresponea premnea* on an ancient oak (1/24). An ancient hollow ash here has no significant species. Area 2 likewise comprises scattered trees in pasture, with *Cresponea* on one tree. *Usnea articulata* was recorded here, but it seems to be widespread in the Park area. It is doubtful whether these areas should be included within an SSSI, although *Cresponea* represents a parkland element and is not merely a field-tree species.

Area 3 has only scattered interest and is not a compact area. There is some case for inclusion of Trees 3/7 to 3/12 within an SSSI boundary. Tree 3/8 at the edge of woodland has *Cresponea*; it is ancient and now dead, but will provide dry lignum habitat later. Tree 3/12 has the Near Threatened *Heterodermia obscurata* on the base, but this is an unusual occurrence of a species typically found on twigs at Pixton, so its significance it difficult to assess; possibly it occurs in the canopy. These trees are

somewhat separated from the main Park, but are connected by a strip with mature oaks which currently have little or no interest (Trees 3/13 to 3/22).

Area 4 is distant from the main Park and is not viable on its own, with only one living mature oak and an almost-dead veteran. Area 5 has no significant interest.

Sanderson (2017a, pages 48–51) provided detailed management advice for both woodland and more open areas within Pixton Park. These recommendations should be followed as far as possible. A brief summary relevant to the park surrounds is given here:
Maintain good light conditions, whilst also maintaining shelter from drying winds where possible. Trees in pasture in the surrounds are mostly isolated and well-lit. However, ivy growth is present on many trees and should be removed if possible. This is likely to be a continuous process, as regrowth can be rapid. Young ivy can completely shade out lichens on the trunk, and a lot of ivy in the crown may make the tree unstable. Although holly can support significant lichens within the park (Sanderson 2017a), it has the potential to severely shade tree trunks and obliterate any significant lichens (Fig. 19). Holly has probably benefited from warmer winters, and is becoming a problem at many sites in Britain; it should be removed when it is growing close to a veteran tree. Rhododendron also casts a very heavy shade and total removal is the best option for the lichen interest.

Many of the oaks in the surrounds are on current or former field boundaries. A few are, however, completely enclosed within hedges and sometimes by barbed wire (Figs. 13, 17). These trees are out of the reach of stock, and the trunks are often covered by young ivy. If resources were available, it might be possible to partially expose these trees. Although they have no significant lichens at present, this would be helpful for the future.

Feeding stock concentrates dung deposition in one place, locally increasing ammonia levels. Feeding in Area 1 was mostly near to trees, presumably for the shelter they provide, but it would be an advantage if stock were fed away from mature trees.

Due to the need for long-term succession, mature or younger trees which are present should be retained. Tree-planting would be ideal, especially of pedunculate oak from local stock. New plantings should not be so close to existing trees that they will over-shade them. Creating grazing exclosures and sowing them with local acorns in mast years may be an alternative to tree-planting. Saplings would eventually need to be thinned to single trees and protected.

Oaks retain value for lichens to the end of their lives, and beyond. Dead trees and fallen boughs should not be removed or cut up (smaller branches can be cleared).

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Annexes

All photos can be attributed to the author

Table 1. Species recorded in Pixton Park surrounds, 2018.	
Acrocordia gemmata	1/2 Q.
Amandinea punctata	1 & 2: rare on oak and lime trunks. 1/7 Q, 1/9 T r, 2/5 Q r.
Anisomeridium ranunculosporum	Very rare on oak trunks. 1/6 Q r, 2/4 Q.
Arthonia cinnabarina	by 3/1 Ca, 4 Ca.
Arthonia elegans	3: hazel, occasional. 5: oak.
Arthonia radiata	1: oak twigs. 3: ash twigs.
Arthonia vinosa	1: local on old oaks; 1/1: Q , 1/3 Q, 1/10 Q, 1/11 Q, 1/12 Q, 3/24 Q, 3/25 Q, 3/26 Q, 4/4 Q.
Arthopyrenia analepta [F]	1: oak twigs.
Arthopyrenia salicis	by 3/3 Ca twig.
Bacidia biatorina	Local on old oaks. 1/2 Q, 1/4 Q c.fr., 1/5 Q, 3/3 Fe, 3/6 Fe, 3/8 Q, 3/10 Q r, 3/24 Q, 3/25 Q, 3/26 Q.
Bacidia rubella	1/23 Fe abundant,
Bacidia viridfarinosa	1/23 Fe. 3/1 Q, 3/23 Fe.
Buellia griseovirens	2/1 Q, 2/5 Q. Material is K + yellow.
Candelariella reflexa	1/11 Q twig rare.
Catinaria atropurpurea	1: rare on oak. 1/5 Q r, 3/3 Fe, 3/5 Fe r, 3/6 Fe r.
Chaenotheca brunneola	1/12 Q on exposed wood.
Chaenotheca stemonea	1/10 Q sterile thallus. This species can be found sterile, and identified by the very fine green thallus containing *Stichococcus.*
Chaenotheca trichialis	Rare in dry bark crevices and wood of old oaks. 1/3 Q, 1/12 Q exposed wood, 4/4 Q exposed wood.
Chaenothecopsis nigra [F]	1/10 Q, amongst *Chaenotheca stemonea* on old oak.
Chrysothrix candelaris	1: frequent in rather small quantity on dry bark of old oaks. 2: oaks. 3: oaks. 5/1 Fe.

Chrysothrix flavovirens	1: occasional on dry acid bark of old oaks. 1/7 Q, 1/10 Q.
Cladonia chlorophaea	3: rare, on one oak.
Cladonia coniocraea	1: oak trunks, rare. 2: oaks. 3: rare on oak.
Cladonia parasitica	3/1 Q dead branch fallen from tree.
Cladonia polydactyla	1: acid oak trunks, rare. 2: oaks. 3: oaks. 4: oak wood.
Cladonia pyxidata	1: occasional on mossy bark of oak oaks. 3: mossy bark of oak and ash.
Cliostomum griffithii	1: frequent on dry bark of oaks. 3: oaks.
Cresponea premnea	Occasional on dry sides of old oaks. 1/2 Q r, 1/4 Q f, 1/5 Q f, 1/10 Q r, 1/12 Q, 1/15 Q r, 1/16 Q, 1/24 Q, 2/6 Q f, 3/8 Q, 3/9 Q r, 3/13 Q o, 4/4 Q.
Dimerella lutea	1: oaks, very rare. 1/11: Q r sterile, 5/2 Ca.
Diploicia canescens	3/13 Q frequent.
Enterographa crassa	1: on oaks, in small quantities, occasional. 2: oaks. 3: oak, ash and hazel. 4: oak. 5: ash. 2/4 Q, 4/3 Q.
Evernia prunastri	1: occasional on oak trunks and twigs. 3: oak, occasional. 5: sloe twigs.

Flavoparmelia caperata	1: frequent on oak trunks and twigs. 2: oaks. 3: ash twigs. 5: sloe twigs.
Fuscidea lightfootii	1: oak twigs. 3/13 Q twigs
Graphis scripta	1: ash twigs. 3: hazel. 4: hazel. 5: hawthorn.
Gyalecta truncigena	2/2 Q.
Heterodermia obscurata	3/12 Q rare on mossy base.
Hypogymnia physodes	2: oaks, rare. 2/3 Q r, 2/5 Q, 3/13 Q twigs
Hypogymnia tubulosa	3/13 Q twigs.
Hypotrachyna afrorevoluta	1: occasional on oak and ash twigs. 3: ash and oak twigs.
Hypotrachyna revoluta	1: occasional on oak and ash twigs. 3: ash twigs. 5: sloe twigs.
Lecanactis abietina	1: frequent on oaks. 2: oaks. 3: oaks, frequent. 5: ash.
Lecanora argentata	1: oak trunks, occasional.
Lecanora chlarotera	1: oak trunks and twigs. 3: oak.
Lecanora expallens	1: occasional on dry sides of old oaks.
Lecidella elaeochroma	1: oak twigs. 3: ash twigs.
Lepraria incana	1: frequent on dry bark and wood on old oaks, mainly as a dark blue-grey morph. 3: oaks, frequent, including blue-grey morph. 4: oak wood.
Lepraria lobificans	3: oak and ash. 5/1 Fe.
Lepraria sylvicola	Occasional on oaks. 1/3 Q, 3/10 Q, 4/3 Q.
Lepraria umbricola	Rare. 3/7 Q on exposed wood near base of trunk, 4/2 Q wood.
Megalaria pulverea	1/18 Q, 2/4 Q.
Melanelixia glabratula	1: rare and in small quantity on oak trunks. 3: rare on ash.
Melanelixia subaurifera	1: frequent on oak twigs; ash twigs. 5: sloe twigs.
Melanohalea exasperatula	1: occasional on oak twigs. 3: ash twigs.
Melanohalea laciniatula	1: occasional on oak and ash twigs.
Micarea prasina	3: oak wood, occasional.
Milospium graphideorum [LF]	2: on unidentified lichen on oak. 2/6 Q.

Mycobilimbia epixanthoides	Rare. 1/2 Q.
Normandina pulchella	1: occasional on old oak trunks. 3: ash.
Ochrolechia subviridis	1: occasional on oak trunks. 2: oaks. 3: occasional on ash and oak. 1/5 Q, 1/11: Q, 3/3 Fe, 3/12 Q.
Ochrolechia turneri	3/3 Fe.
Opegrapha atra	3/3 Fe. 5: hawthorn.
Opegrapha corticola	4/4 Q.
Opegrapha ochrocheila	5/1 Fe.
Opegrapha sorediifera	2: oak. 5: sloe. 2/1 Q. 3/4Fe.
Opegrapha varia	1: oak trunk, ash twigs. 3/23 Fe, 5/1 Fe.
Opegrapha vermicellifera	3/23 Fe.
Opegrapha vulgata	1/5 Q, 1/10 Q. 3/1 Ca, 5/1 Fe.
Pachyphiale carneola	1: rare on oak trunks. 3: rare on ash. 1/5 Q r, 1/10 Q r, 3/3 Fe.
Parmelia ernstiae	1: occasional on oak trunks.
Parmelia saxatilis	2/3 Q fallen branch, 3/12 Q.
Parmelia sulcata	1: frequent on oak twigs. 3: ash twigs.
Parmelina pastillifera	3: ash twigs.
Parmelina tiliacea	3/12 Q.
Parmotrema perlatum	3: ash twigs. 5: sloe twigs.
Parmotrema reticulatum s.l.	1: occasional on oak trunks. 2: oaks. 1/10 Q, 1/11: Q, 1/12 Q, 1/18 Q, 1/19Q, 1/22 Q, 2/1 Q, 2/3 Q.
Peltigera praetextata	5/1 Fe.
Pertusaria albescens	1: oak trunks, frequent. 2: oaks. 3: ash twigs. 5/1 Fe.
Pertusaria amara	1: occasional on oaks. 2: oaks. 3: oaks. 1/3 Q,
Pertusaria coccodes	Occasional on oaks in pasture. 2/2 Q a, 2/3 Q, 3/12 Q.
Pertusaria hemisphaerica	Local on old oak trunks. 1/1: Q, 1/3 Q, 1/10 Q in good quantity, 3/26 Q.
Pertusaria hymenea	1: frequent on oaks. 2: oaks. 3: oak, ash.
Pertusaria leioplaca	1: occasional on oak twigs.
Pertusaria multipuncta	3/3 Fe branch.
Pertusaria pertusa	1: occasional on oak trunks. 2: oak. 3: oak. 1/5 Q,
Phaeographis smithii	1/11 Q twig, 1/14 Q twig, by 3/3 Ca twig, near 5/1 Cm.
Phlyctis argena	1: occasional on oak trunks. 2: oaks. 3: ash.
Phyllopsora rosei	4/3 Q r.
Physcia aipolia	1/23 Fe twigs.
Physcia tenella	1: occasional on oak and ash twigs, in small quantities. 3: ash twigs.
Pseudevernia furfuracea var. *furfuracea*	2: fallen branch of oak. 2/3 Q.

Punctelia reddenda	1: rare on oaks. 1/11: Q la, 1/12 Q r, 3/12 Q f.
Punctelia subrudecta	1: oak twigs. 5: sloe. 3/13 Q twigs
Pyrrhospora quernea	1: frequent on oak trunks. 2: oaks. 3: oak.
Ramalina farinacea	1: frequent on oak twigs. 3/13 Q twigs
Ramalina fastigiata	1: occasional on oak twigs.
Schismatomma cretaceum	Rare. 4/4 Q.
Schismatomma decolorans	1: on dry sides of old oaks, often abundant. 3: oaks, frequent. 5/1 Fe.
Thelotrema lepadinum	1: rare on old oaks. 3: occasional on oak and hazel. 4: hazel and alder, lf. 5: sloe. 1/3 Q lf, 1/24 Q r, 2/4 Q r, 2/ Q r, 3/1 Q, 3/3 Fe, 3/4 Fe, 3/10 Q, 3/12 Q, 3/14 Q f, 3/24 Q, 3/26 Q.
Trapelia corticola	3/1 Q.
Usnea articulata	2: high twigs of oaks. 3: twigs of oak and ash, probably frequent in canopy. 2/3 Q, 2/5 Q, 3/3 Fe, 3/12 Q, 3/19 Q.
Usnea flammea	2: oak trunks. 3: occasional on oak trunks. 2/3 Q, 2/5 Q, 3/12 Q, 3/13 Q.
Usnea rubicunda	3/14 Q.
Usnea subfloridana	1: occasional on oak twigs. 2: oak twigs. 3/13 Q twigs.
Xanthoria parietina	1: occasional on oak and ash twigs, in small quantities. 3: ash twigs.

Numbers refer to Areas (1-5) and to target notes under each Area, e.g. 1/1, 1/2 etc.

Q = oak, Fe = ash, Ca = hazel, Cm = hawthorn. F = non-lichenised fungus, LF = lichenicolous fungus.

Table 2. Species with conservation grading, or woodland ecological indicator.

	RDB	NR/NS	IR	S41	ERDB	Notable	SOWI	URI
Heterodermia obscurata	NT	NS					SOWI	URI
Usnea articulata	NT		IR	S41				
Bacidia biatorina		NS				Nb	SOWI	
Chaenotheca stemonea		NS				Nb	SOWI	
Chaenothecopsis nigra [F]		NS				Nb		
Cresponea premnea			IR			Nb	SOWI	
Milospium graphideorum [LF]		NS				Nb		
Opegrapha corticola			IR			Nb		
Phyllopsora rosei		NS	IR		NT	Nb	SOWI	
Schismatomma cretaceum			IR			Nb		
Anisomeridium ranunculosporum							SOWI	
Arthonia vinosa							SOWI	
Catinaria atropurpurea							SOWI	
Chaenotheca brunneola							SOWI	
Chaenotheca trichialis							SOWI	
Cladonia parasitica							SOWI	
Mycobilimbia epixanthoides							SOWI	
Pachyphiale carneola							SOWI	
Pertusaria multipuncta							SOWI	
Punctelia reddenda							SOWI	
Thelotrema lepadinum							SOWI	
Megalaria pulverea								URI
Trapelia corticola								URI

RDB = Red Data Book, NR/NS = Nationally Rare, Nationally Scarce, IR = International Responsibility, S41 = Section 41, ERDB = provisional English Red Data Book, SOWI = Southern Oceanic Woodland Index, URI = Upland Rainforest Index.

Table 3. Comparison of Pixton Park and its surrounds: scores for ecological continuity and conservation value														
	Sanderson 2017 (Pixton Park)							Orange 2018 (Park						
Measure/Years	**Area 1**	**Area 2**	**A1 & 2**	**Area 3**	**Area 4**	**A3 & 4**	**Total**	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**	**Total**	**Total 2017 -**
Total taxa	29	1	13	7	12	15	**19**	69	28	72	14	23	**10**	**19**
SOWI Indicator	12	38	38	9	23	25	**41**	12	1	10	5	1	**15**	**42**
URI Indicator	2	8	8	3	3	6	**9**	1	1	2	0	0	**3**	**9**
Endangered RDB spp	0	0	0	0	1	1	**1**	0	0	0	0	0	**0**	**1**
Vulnerable RDB spp	0	0	0	0	1	1	**1**	0	0	0	0	0	**0**	**1**
Near Threatened RDB spp	0	7	7	1	2	2	**7**	0	1	2	0	0	**2**	**7**
Notable species	8	24	24	8	15	21	**32**	4	2	2	4	0	**8**	**32**
International Responsibility spp	7	18	18	4	11	12	**23**	1	2	2	4	0	**5**	**23**
S41 spp	0	3	3	1	3	3	**5**	0	1	1	0	0	**1**	**5**

Based on Sanderson (2017) Table 2. Note that Areas in 2017 and 2018 are not equivalent.

Table 4. Comparison of 'systematically recorded species' between Pixton Park and the surrounds.											
	Pixton Park (Sanderson 2017)					Pixton Park surrounds (Orange 2018)					
Species	**Pixton**	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Surround**	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Arthonia invadens	**1**	0	1	0	0						
Bacidia incompta	**1**	0	0	0	1						
Chaenotheca brunneola	**3**	0	2	0	1	**1**	1	0	0	0	0
Chaenotheca stemonea	**0**	0	0	0	0	**1**	1	0	0	0	0
Chaenotheca trichialis	**5**	0	1	3	1	**2**	2	0	0	1	0
Chaenothecopsis nigra	**1**	0	0	1	0	**1**	1	0	0	0	0
Chaenothecopsis savonica	**2**	0	2	0	0						
Cresponea premnea	**63**	1	44	1	8	**1**	9	1	3	1	0
Collema fragrans	**1**	0	0	0	1						
Fuscopannaria mediterranea	**1**	0	1	0	0						
Heterodermia obscurata	**6**	0	3	0	3	**1**	0	0	1	0	0
Lecanographa lyncea	**12**	0	10	2	0						
Lobaria pulmonaria	**3**	1	1	0	1						
Lobaria scrobiculata	**1**	0	0	0	1						
Microcalicium ahlneri	**2**	0	1	1	0						
Mycobilimbia epixanthoides	**3**	0	2	0	1	**1**	1	0	0	0	0
Mycobilimbia pilularis	**5**	0	4	0	1						
Opegrapha corticola	**1**	0	0	0	1	**1**	0	0	0	1	0
Pannaria conoplea	**1**	0	1	0	0						
Phlyctis agelaea	**2**	0	2	0	0						
Phyllopsora rosei	**6**	2	4	0	0						
Porina coralloidea	**3**	1	2	0	0						

Rinodina roboris var. *roboris*	**1**	0	0	0	1						
Sticta ciliata	**11**	0	11	0	0						
Sticta limbata	**1**	0	1	0	0						
Taeniolella toruloides	**1**	1	0	0	0						
Thelopsis rubella	**3**	0	3	0	0						
Usnea articulata	**20**	0	4	1	1	**lf**	0	+	f?	0	0
Wadeana dendrographa	**1**	0	1	0	0						
Xerotrema quercicola	**1**	0	1	0	0						
Waypoints	**10**	3	66	1	2	**2**	1	2	5	3	0

Based on Sanderson (2017) Table 3. *Chaenotheca stemonea* has been added to the list.

lf = locally frequent, f = frequent, + = present.

Table 5. Target notes				
Number	Corrected latitude/ longitude	National Grid	Ancient tree survey number	Notes
1/01	51.038014 -03.534631	SS9250027638	12	Oak: Arth vin. Fig. 4. *Small holly adjacent to trunk should be removed.*
1/02	51.03807 -03.53492	SS9247927645	13	Oak: Baci bia, Cres pre rare, Myco epi, base-rich with mosses Homalothecium sericeum, Zygodon rupestris. Fig. 5. *Ivy should be cut off.*
1/03	51.037862, -3.535506	SS9243827623	14	Oak: Arth vin, Chaen tri, Thel lep lf. Fig. 6.
1/04	51.03762 -3.53615	SS9239227597	15?	Oak: Baci bia, Cres pre f . Fig. 7.
1/05	51.03765 -03.53612	SS9239427600	16?	Oak: Baci bia, Cati atr 2 colonies on W side, Cres pre f, Pach car 1 colony W side. Fig. 8.
1/06	51.03771 -3.536349	SS9237827607	17?	Oak: Arth ran rare. Fig. 9.
1/07	51.037702 -3.536425	SS9237327606	18?	Oak. Fig. 9.
1/08	51.03809 -03.53664	SS9235927650	not list	Stag-headed oak in hedge (no photo).
1/09	51.037876 -3.53709	SS9232727627	19	Lime. Fig. 10.
1/10	51.03788 -03.53726	SS9231527627	20	Oak. Fig. 10.
1/11	51.037686 -3.538167	SS9225127607	21	Oak: Arth vin, Cres pre small amount east side, Pach car small amount east side (Parm ret, Pert hem). Fig. 11.
1/12	51.037382 -3.538548	SS9222327574	22	Oak: Chaen tri exposed wood on S side, Punc red rare. Fig. 12.
1/13	51.03787 -03.53870	SS9221427628	28	Oak in hedge, a ot of ivy on trunk and in crown. Fig. 13. *Remove ivy, maybe free tree from hedge.*
1/14	51.038322 -3.539169	SS9218227679	23	Oak: a lot of young ivy starting. Fig. 14.
1/15	51.03858 -03.53937	SS9216927708	24	Oak: badly infested with ivy, Cres pre rare on S side. Fig. 15. *Cut ivy.*
1/16	51.03894 -03.53892	SS9220127747	25	Oak: pollard, Chae ste at 1.8 m on E side, with Chaen nig. Fig. 16. *Young and old ivy should be removed.*
1/17	51.03875 -03.53773	SS9228427725	26	Oak: badly infested with ivy, grazing animals cannot reach trunk. Fig. 17. *Perhaps free tree from hedge.*

1/18	51.03734 - 03.54014	SS9211227571	29	Oak on old boundary. Fig. 18. *Remove young ivy, keep free of holly saplings.*
1/19	51.03738 - 03.53994	SS9212627576	30	Oak with much ivy, badly shaded by holly. Fig. 19. *Remove holly, although there are currently no notable species.*

1/20	51.036533 - 3.53906	SS9218627480	89	Oak with much ivy, and wrapped around with wire. Fig. 20. *Remove wire, perhaps also hawthorn saplings.*

1/21	51.03549 -03.54005	SS9211427366	not listed	Oak on vanished boundary, not very large, nor very stable. Fig. 21.
1/22	51.03521 -03.54028	SS9209727335	11	Oak. Fig. 22.
1/23	51.03487 -03.54085	SS9205627298	10	Hollow ash. (Baci rub, Baci vir). Fig. 23.
1/24	51.03479 -03.54104	SS9204327289	9	Oak, mostly dead. Cres pre mainly W side, The lep rare on N side. Fig. 24. *Perhaps cut back some of the shading holly, but leave enough to retain some shelter.*
2/01	51.032863 -3.538596	SS9221027071	7	Oak. Fig. 25.
2/02	51.03267 - 03.53901	SS9218027050	6	Oak.
2/03	51.03228 - 03.53950	SS9214527008	5	Oak. Usne art (Usne fla, Pseu fur on branches).
2/04	51.03103 - 3.537683	SS9226926866		Oak.
2/05	51.03123 - 03.53743	SS9228826888	4	Oak. Usne art (Usne fla). Fig. 26.
2/06	51.02999 - 03.53671	SS9233526749		Oak. Cres pre f on S side. Fig. 27.
3/01	51.031746 -3.524322	SS9320826926	70	Oak: Clad par (on fallen branch), Thel lep, Trap cor. Fig. 28.
3/02	51.031594 -3.524262	SS9321226909	71	Oak (inaccessible, looks poor).
3/03	51.031552 -3.523288	SS9328026903	72	Ash: Cati atr, Pach car, Thel lep, Usne art. Fig. 29.
3/04	51.031556 -3.523032	SS9329826903		Ash: Thel lep.
3/05	51.03151 - 03.52275	SS9331826898		Ash: Cati atr rare.
3/06	51.031554 -3.52279	SS9331526903		Ash: Cati atr rare.
3/07	51.03015 - 03.52308	SS9329126747	74	Oak. (Lepr umb on exposed wood). Fig. 30.
3/08	51.03029 - 03.52299	SS9329826762	76	Oak. Apparently dead. Baci bia, Cres pre. Shaded by holly. Will be source of dead wood later. Fig. 31.
3/09	51.03033 - 03.52299	SS9329826767		Oak. Cres pre. Fig. 31.
3/10	51.03041 - 03.52314	SS9328826776	75?	Mature oak, not old. Baci bia, Thel lep.
3/11	immediately N of last	immediately N of last		Oak.
3/12	51.03064 - 03.52328	SS9327826802	78	Oak. Hete obs rare on base, Punc red f, Thel lep, Usne art (Parm til, Pert coc, Usne fla). Fig. 32.
3/13	51.03094 - 03.52404	SS9322626836	79	Oak. Cres pre, Usne art (Dipl can). Fig. 33.

3/14	51.03067 -03.52427	SS9320926807	81	Oak The lep (Usnea fla, Usne rub). Fig. 34.

3/15	51.030962 -3.524769	SS9317526840	not listed?	Oak. Acidic.
3/16	51.03095 -03.52492	SS9316426839	not listed?	Mature oak. Acidic, drowning in Rhododendron.
3/17	51.03108 -03.52519	SS9314526853	[82/83	Oak. Very mossy, shaded by Rhododendron.
3/18	just S of next	just S of next	[82/83	Oak. Buried in Rhododendron.
3/19	51.031332 -3.525683	SS9311126882	[82/83	Oak. Usne art fallen from this or nearby. Buried in Rhododendron.
3/20	51.03130 -03.52576	SS9310626879	[82/83	Oak. Buried in Rhododendron. Fig. 35.

3/21	51.03143 - 03.52604	SS9308726894	[82/83	Oak. Buried in Rhododendron. Fig. 36.
3/22	51.03165 - 03.52650	SS9305526919	84	Oak.
3/23	51.03237 - 03.52546	SS9313026997	66	Old ash pollard on hedgebank by ruined farm. Fig. 37.
3/24	that the trees are mature but not ancient, so	SS9324127004	67?	Oak. Arth vin, Baci bia, Thel lep. Fig. 38.
3/25	51.03247 - 03.52387	SS9324127006	68?	Oak. Arth vin, Baci bia f. Fig. 39.
3/26	51.03243 - 03.52383	SS9324427002		Oak. Arth vin, Baci bia, Thel lep (Pert hem). Fig. 40.
4/02	51.03659 - 03.52304	SS9330927463	60	Dead oak lying on steep bank.
4/03	51.03600 - 03.52255	SS9334227397	61	Oak on river bank, Phyll ros rare (Ente cra, Lepr syl). Fig. 41.
4/04	51.03496 - 03.52217	SS9336627281	62	Oak, upper parts lost, now all but dead. Arth vin, Cres pre, Opeg cor, Schi cre. Fig, 42.
5/01	51.02884 - 03.52039	SS9347726597	37	Ash. Fig. 43.
5/02	51.02845 - 03.52009	SS9349726554		Hazel. Dime lut.
Lichen names are abbreviated. GPS readings corrected where possible according to satellite view,				
National Grid converted from latitude/longitude.				
A few management recommendations are given, in italics.				

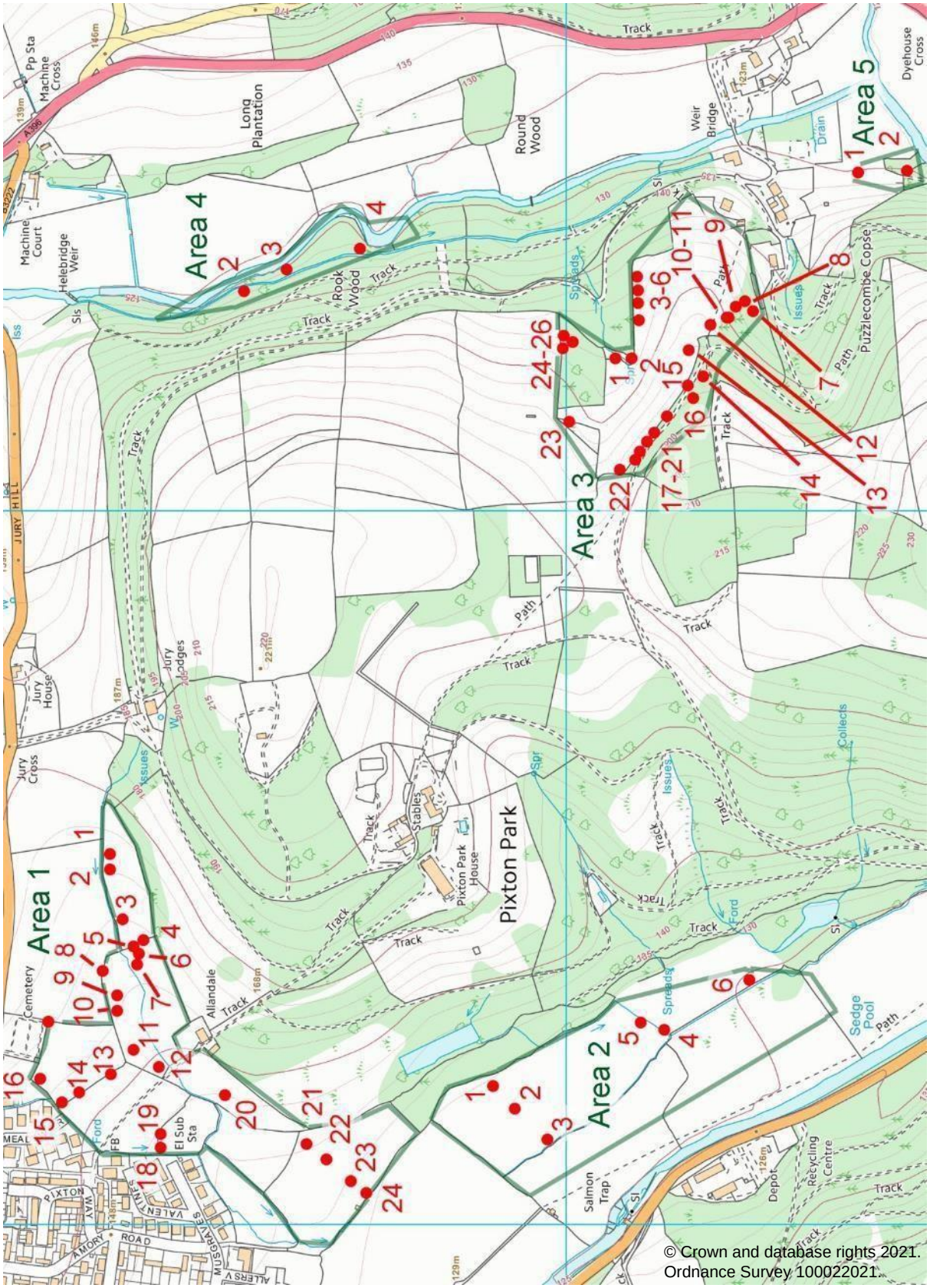

Fig. 1. Areas surveyed in 2018, with target notes (mostly mature/veteran trees). Green polygons: areas designated for survey.

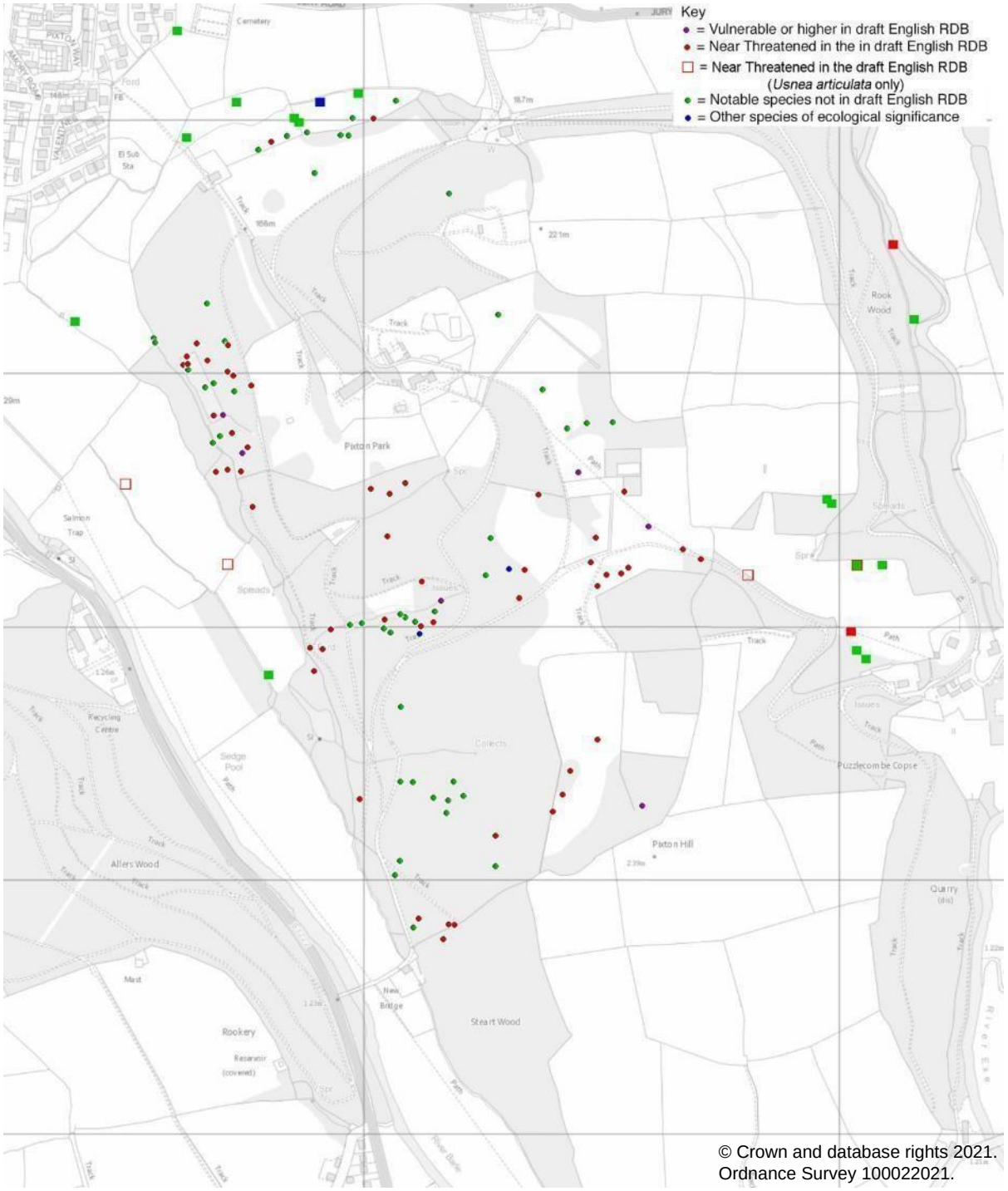

Fig. 2. Distribution of categories of 'systematically recorded species' in Pixton Park in relation to the park surrounds. Based on Map 11 in Sanderson (2017a): round dots are waypoints recorded by Sanderson in Pixton Park; square dots are surrounds recorded in 2018. *Usnea articulata* is denoted by a separate symbol as it was not possible to record this consistently in 2018; it is not distinguished in the Pixton Park symbols.

Fig. 3. Area 1, looking west, with Tree 1/1 on right.

Fig. 4. Tree 1/1.

Fig. 5. Tree 1/2

Fig. 6. Tree 1/3.

Fig. 7. Tree 1/4.

Fig. 8. Tree 1/5.

Fig. 9. Trees 1/6 and 1/7, with trampled, dung-enriched ground from cattle-feeding.

Fig. 10. Trees 1/9 and 1/10.

Fig. 11. Tree 1/11.

Fig. 12. Tree 1/12.

Fig. 13. Tree 1/13.

Fig. 14. Tree 1/14.

Fig. 15. Tree 1/15.

Fig. 16. Tree 1/16.

Fig. 17. Tree 1/17.

Fig. 18. Tree 1/18.

Fig. 19. Tree 1/19, heavily shaded by ivy and holly.

Fig. 20. Tree 1/20.

Fig. 21. Tree 1/21.

Fig. 22. Tree 1/22.

Fig. 23. Tree 1/23.

Fig. 24. Tree 1/24.

Fig. 25. Tree 2/1.

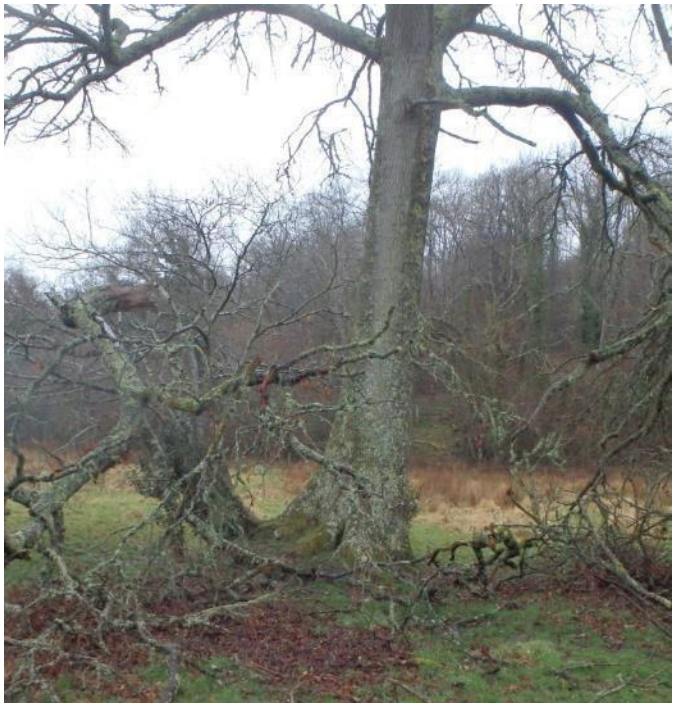

Fig. 26. Tree 2/5.

Fig. 27. Tree 2/6.

Fig. 28. Tree 3/1.

Fig. 29. Tree 3/3.

Fig. 30. Tree 3/7.

Fig. 31. Trees 3/9 (left) and 3/8 (right).

Fig. 32. Tree 3/12.

Fig. 33. Tree 3/13.

Fig. 34. Tree 3/14.

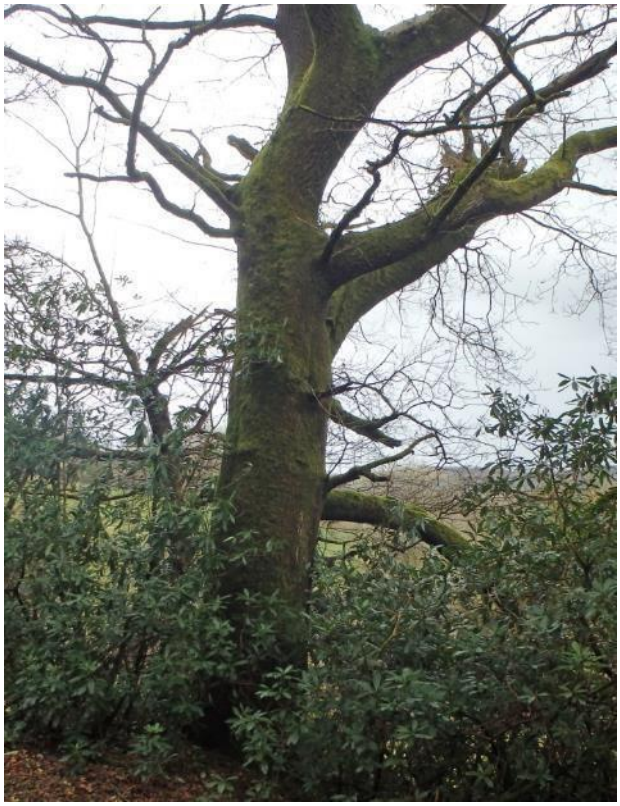

Fig. 35. Tree 3/20.

Fig. 36. Tree 3/21, heavily shaded by Rhododendron.

Fig. 37. Tree 3/23, a large ash pollard on hedgebank by ruined farmhouse.

Fig. 38. Tree 3/24.

Fig. 39. Tree 3/25.

Fig. 40. Tree 3/26.

Fig. 41. Tree 4/3.

Fig. 42. Tree 4/4.

Fig. 43. Tree 5/1.

Attempted transplantation of *Fuscopannaria mediterranea*

This species was known only from one tree in Pixton Park and the tree had recently died (Sanderson 2017a). It was suggested that tranplantation should be attempted, as the lichen will not survive for long on a dead tree.

Fig. 44. The dead tree with *Fuscopannaria*, on the left side.

This is Tree PX047 of the survey by Neil Sanderson (2017a). It is the only tree at Pixton with *Fucopannaria mediterranea*, and has died. The oak is in fairly well-lit woodland, on a gentle WSW slope near the valley bottom; the ground is flushed and wet. The area has scattered hazel and numerous young ash, also some small hawthorn and hawthorn saplings, suggesting grazing has declined and shade has increased. *Fuscopannaria* was on the SSW side of the trunk, on more or less vertical bark (90–100°). The bark is moderately rain-sheltered, so that mosses are very sparse, although it was wet on 15 March from hours of rain overnight. The dead bark is already loose. A relevé 60 × 30 cm was recorded on the main area of *Fuscopannaria*, using the Domin scale of cover-abundance:

Opegrapha varia	8
Lepraria vouauxii	4
Fuscopannaria mediterranea	3
Zygodon rupestris	3
green soralia	2
Gyalecta truncigena	2
Pertusaria hemisphaerica	2
Acrocordia gemmata	1
Rinodina roboris	1 bark 4

Fig. 45. The tree with *Fuscopannaria*, position of some colonies indicated by blue dots.

Fig. 46. The recipient tree (centre).

An oak with base-rich bark was needed as a recipient tree. Some of the oaks along the western slopes of Pixton Park were examined, guided by the mention of base-loving lichens on certain trees in Sanderson (2017a). Most oaks in the area were not particularly base-rich. In some cases, although base-indicator mosses were present on the wetter side of the trunk, the transition from wet and mossy to dry-bark lichen communities was too abrupt to provide the only moderately dry, lichen-dominated community which *Fuscopannaria* might be expected to favour.

The chosen tree was an over-mature pollard oak in a well-lit glade south of a stream, at 51.03050 -3.53331 (SS92575.26801). This is probably Tree PX024 of Sanderson. The south side had areas dominated by the pleurocarpous mosses *Homalothecium sericeum* and *Isothecium myosuroides*, areas with the acrocarpous moss *Zygodon* and a few crustose thalli, and dry areas with *Cresponea premnea*. Areas where *Zygodon* was becoming sparse due to increasing rain-shelter, were considered suitable for transplant sites.

Transplant method

Past attempts at lichen transplantation have most often been tried with macrolichens, but the methods are generally not published. Problems have included an insufficient contact between the lichen and the bark, and damage from invertebrates. Lichens are said to sometimes remain stranded on transplanted bark, failing to grow onto new bark. Some attempts have used small vegetative propagules instead of intact thalli; here there was a problem with the propagules being washed off the bark, which was partly solved by placing them on squares of gauze atached to the bark. However, relatively large propagules of leafy lichen species have sometimes been used for this method.

Three methods were considered for the *Fuscopannaria*:

1. Attempting to attach small propagules (soredia) or thallus fragments to squares of gauze to immobilise them.
2. Gluing thin slices of bark to the recipient tree; thin slices were considered as more likely to allow the lichen to grow onto the new bark than large fragments.
3. Pinning slices of bark to the recipient tree using gauze, but without glue.

The final choice of method was influenced by practical difficulties which became more apparent in the field. Although Sanderson (2017a) described *Fuscopannaria mediterranea* as a 'small leafy species', it is at best minutely squamulose, and material at Pixton is little more than small mounds of soredia. Overall, little material was available for transplanting.

Pieces of gauze (an open-mesh gauze for wound-dressing, presumably made of cotton) approximately 20 × 20 mm were cut, and a warm 1% solution of agarose was applied to the centre of each and allowed to set (before coming into the field). Agarose was used in an attempt to make propagules adhere better to the gauze. The prepared gauze was stored in petri dishes.

Slices of bark supporting *Fuscopannaria* were cut from the tree using a scalpel. The bark proved to be crumbly, and thin coherent slices could not be obtained.

Pieces of gauze were folded to make a double thickness *c*. 20 × 10 mm; two beads of Gold Label Pond and Aquarium Sealer were extruded onto the bark, and the ends of the gauze pushed into them. This sealer was used because it is intended to work under water, and the bark was wet from rain the previous night; also it is alleged to be non-toxic. Araldite was also brought into the field, but would not have worked on the wet surfaces; also, it is said to be toxic.

Small fragments of lichen, mostly comprising soredia, were pushed onto the surface of the gauze and spread out as far as was possible. The small amounts of lichen available made this method seem unlikely to succeed, and only three of the prepared gauze patches were used.

The remaining bark fragments were attached to the recipient bark using the Gold Label sealant. Before attaching gauze or fragments, the immediate area of bark was scrubbed lightly with a toothbrush to remove any fragments of moss or debris. Immobilising bark fragments under dry gauze was considered to be unlikely to succeed, as the fragments were small, and the gauze might have made a damp microclimate, and provided shelter for invertebrates.

Even though small fragments of bark were used, the contact with the new bark was minimal, due to the small and uneven nature of the bark fragments, and the difficulty of making a good seal with the sealant. It can only be hoped that propagules released from the lichen fragments may attach to bark below and grow. Only one recipient tree was tried, due to the small amount of material. In retrospect, only two other modifications of transplanting might have been tried: larger pieces of bark could have been removed and attached to the new tree, although this would also rely ultimately on the fragments releasing propagules; alternatively, one could wait
for dry weather, and attach the small fragments with great care using forceps and a glue that requires dry surfaces. In all cases, the chances of success seem extremely low: the starting material is sparse, the thallus forms very small patches which are not coherent, and thechance that any chosen area of bark is correct for this rare lichen is low.

There is probably no advantage in attempting to monitor the transplant in a formal way. In five to ten years the tree could be inspected for signs of *Fuscopannaria* colonies, but the original fragments are unlikely to persist for long. The gauze is intended to help immobilise propagules until they become established, but will decay relatively quickly.

A small sample was retained as a voucher which will be deposited in the National Museum of Wales (NMW). This is to provide a permanent record for this species at Pixton. A very small quantity of the species remains on the original tree.

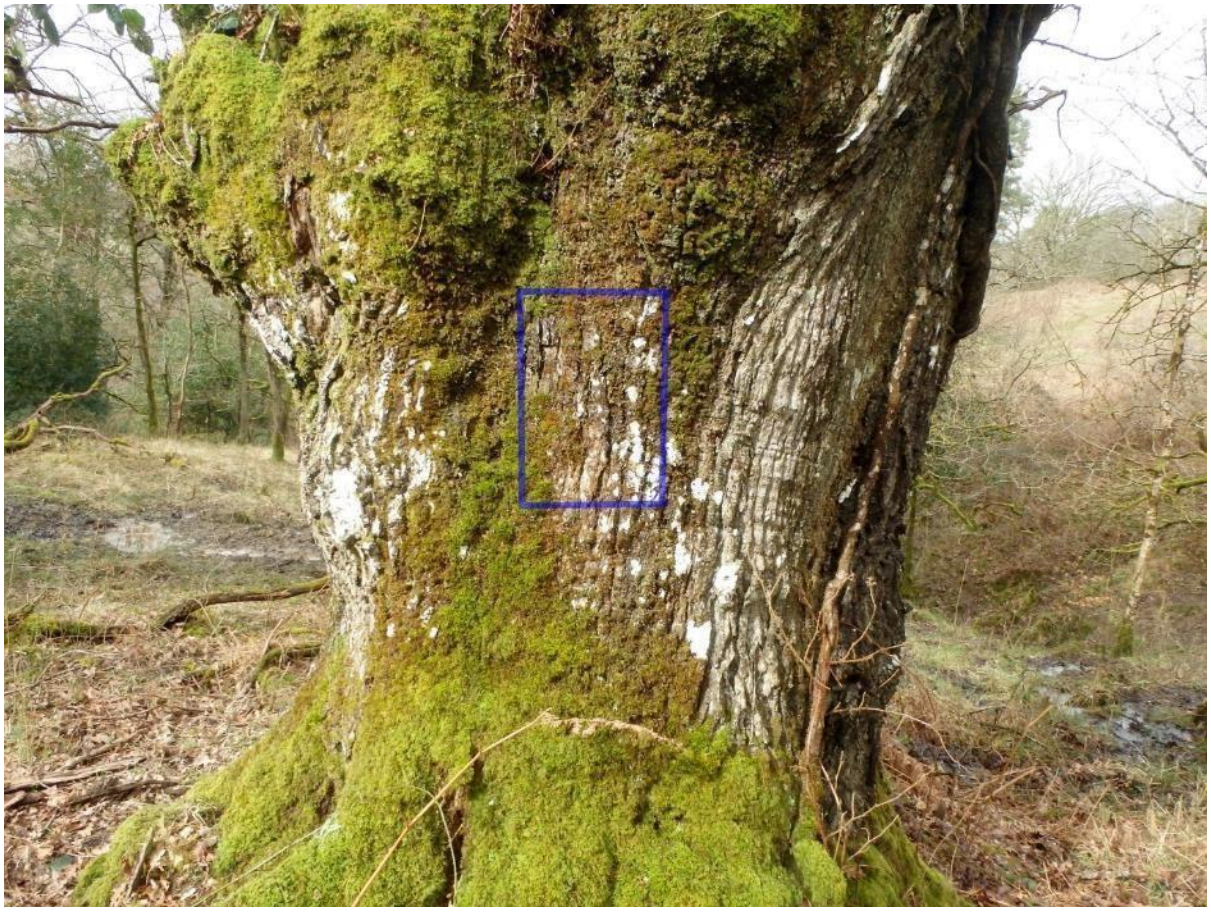

Fig. 47. The blue rectangle shows the area where transplants were attempted.

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