Royal Borough of Kensington and Chelsea

Lichen and Bryophyte Survey of Parks and Gardens

Holland Park
Avondale
Kensington Memorial Park
Athlone Gardens
Emslie Horniman Pleasance Park
Little Wormwood Scrubs
Westfield Park
Cremorne Park
St Luke's Gardens

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Lichen Survey in Kensington and Chelsea Parks

At the beginning of 2011, Simon Davey Ecological Consultancy was commissioned by the Ecological Service Manager, Saskie Laing of the Royal Borough of Kensington and Chelsea to undertake a survey of lichens and bryophytes in nine parks in the Borough. The survey took place during the summer months of 2011, during which time the weather was suitable for the survey. Perhaps the number of bryophytes found would have been greater had the weather been wetter, however actual surveying in wet weather, since it involves the use of a hand-lens which rapidly mists up would have been more difficult. I should like to thank the staff of the Ecological Services for the help they gave me, especially at Holland Park.

Introduction

1.1 Factors effecting the lichen flora

In 2011, the problem of acid rain caused by pollution from power stations and industry is a thing of the past throughout most of Britain. It is doubtful whether there would have been any corticolous lichens in 1970 at most of the sites visited during the current survey. The most likely species to have been present would be *Lecanora conizaeoides* which is highly tolerant of sulphur dioxide in the atmosphere. Today, there has been a complete change in the atmosphere throughout most of London. Instead of an atmosphere with a low pH caused by acid rain, the pH is now high, caused mainly by levels of ammonia in the atmosphere. Although much of this ammonia is neutralised by NOX gases to give ammonium nitrate, there is still sufficient to prevent many species of lichen intolerant of high pH from being present. The high levels of ammonia, and of plant nutrients, encourages the golden yellow species *Xanthoria parietina* and *Xanthoria polycarpa*.. Today these may be seen on most trees, even species of tree that in a healthy atmosphere these lichens would find too acid. Certainly oak has a bark that is too acid for these species, as do alder and most soft wood trees.

It was noted that with the possible exception of the avenue to the south east of Holland Park, that the more mature trees did not support much of a lichen flora. This effect was first noted personally in Hampton Court in 2001. While an avenue of mature trees with blackened bark supported very few lichens, recently planted trees rapidly attracted a healthy, and vigorous flora. This was true especially of oak. Mature oak trees encountered throughout that survey supported almost no lichens. It seems that following acidification during the era of industrial pollution, the subsequent amelioration of sulphur dioxide levels did not correlate to an improvement in the bark as lichen substrate.

As a result of the lower levels of sulphur dioxide and increased pH, a core London lichen flora will flourish on most trees. Any species on this list may be expected to be present on any species of tree. Other lichens not on this list may be considered as of interest, and depending on the substrate species, could probably indicate an area which is less affected by high pH. Species growing on saxicolous habitats, that include brickwork, imported rock,, tiles etc. are scarcely affected by the condition of the atmosphere.

The following species are those that can be considered the core London list:-

Amandinea punctata
Phaeographis orbicularis
Physcia adscendens
Physcia tenella
Xanthoria parietina
Xanthoria polycarpa

Other species that are tolerant of high pH, and likely to be frequent include the following, but not quite so ubiquitous:-

Candelaria concolor
Candelariella reflexa
Physcia caesia
Physconia grisea
Lecanora chlarotera
Lepraria lobificans
Scoliciosporum chlorococcum
Xanthoria ucrainica

In London, those species belonging to the family *Parmeliaceae* that may be reckoned to be less common, and less tolerant of an atmosphere with a high pH, include:-

Evernia prunastri
Flavoparmelia caperata
Flavoparmelia soredians
Hypotrachyna revoluta
Melanelixia subaurifera
Parmelia sulcata
Parmotrema perlatum
Punctelia jeckeri
Punctelia subrudecta

Although there is a correlation between tree species and the lichen flora they support, it was noticeable that on occasions, two trees of the same species within feet of one another could be very different lichen substrates. In Holland Park particularly, a tree with a rich and varied lichen flora could have a neighbour that was completely lichen free.

Although it is certainly true to say that the pH and ammonia levels in the atmosphere, as well as the species of substrate tree, are the most important factors effecting the lichen flora in the study areas, there are other factors that may have an effect, in most cases to a lesser extent. It was noted that towards the north west of Holland Park, and Little Wormwood Scrubs, the trees supported a depauperate lichen flora, and this did not correlate to any difference in substrate tree species. In Holland Park, this area is some fifteen to twenty metres higher than the southern part, and at Little Wormwood Scrubs, there is a lesser correlation between altitude and lichen richness. It is possible that this effect is caused by an ambient pollution effect from a distant source that catches trees at slightly higher altitude. It was noted that there appears to be some correlation between lichen richness and geology. The more drainage efficient gravels seemed to relate to a richer lichen flora than London clays, however there are so many subtle variables in the geology beneath London, and its history of disturbance, any such correlation should be treated as surmise. Fairly recent research has shown a correlation between the richness of the lichen flora of aspen and the underlying soil conditions in Sweden.

It was noted that light levels in the areas with less rich lichen floras were lower than elsewhere, and especially in Holland Park. Lichens are very light demanding organisms. However, the light levels where the lichens were less in evidence in both Holland Park and Little Wormwood Scrubs did not appear to be low enough to affect lichen health. It is possible that in the presence of distress from high pH levels in the atmosphere, that even a slight lowering of light might have a major effect. It should be stated that at Holland Park, the tree with the most exciting lichen flora, a tulip tree in the Japanese Garden was found in an area with a generally low surrounding lichen richness.

There are so many factors that may affect the nature and richness of lichen flora in the London area. The incredible alteration in atmospheric pH since the 1970s is such a major factor that it is extremely difficult to isolate other influences. The presence of PM10 particles surrounding limestone quarries in other parts of Britain, has been found to be far-reaching. The same may be true of PM10s in London. Levels of other gases such as carbon monoxide, carbon dioxide and ozone may also affect the flora, and very exact research would be needed to isolate these factors from other considerations.

It was several years ago that a correlation between atmospheric ammonia levels and catalytic converters was recognised. Research into this problem has been taken very seriously in the United States, but has lagged behind in Europe, and especially in Britain. The astonishing effect on the lichen flora over such a brief period of time since the improvements to air quality caused by the twin effects of the loss of industry and clean air acts on sulphur dioxide, and the more recent increase of ammonia, is little short of incredible.

1.2. Conservation Considerations

Clearly the most major effects on the lichen flora are atmospheric, and little can be done to improve these. Light levels are very important for lichen health, and there may be areas in the north of Holland Park especially, where some thinning of regeneration could be helpful. It appears that cherry trees, having a low pH bark, seem to support a more varied lichen flora. In view of the richness of the flora on the tulip tree at Holland Park, the planting of further tulip trees could be advantageous. Similarly, the magnolias close to the offices in Holland Park also carry an interesting flora, as does the very young red oak avenue in the lower part of Holland Park and in the adjoining sports pitch. Therefore planting of suitable exotic trees should be considered.

Untreated worked wood carries a rich lichen flora, and the provision of untreated oak seating would be expensive, but would increase lichen richness. The use of chestnut palings for fencing would also provide a new habitat for lichens. Although probably not acceptable to recommend, the use of asbestos cement roofing would also increase lichen richness. Brick wall tops should not be cleaned of soil accumulation, and this should increase bryophyte richness. The encouragement of limestone structures such as sculpture made of limestone would also increase the number of lichens present.

It is essential that the cleaning of lichen-rich surfaces, an activity especially common in certain churchyards should not take place.

1.3. Methodology

Using a X 10 hand-lens, each area was listed habitat by habitat for the lichens and bryophytes it supported. Particularly care was taken to correlate substrate trees and the lichens they supported. A basic list of the species occurring on each species of tree was made for each of the sites. In most sites, saxicolous habitats were not much in evidence. Brickwork, stonework and tiling was in short supply, however where suitable habitats were located, similar lists were made.

It was perhaps a surprise that there was little variation in the lichen flora on the various substrates. The one notable exception was the flora on the tulip tree in Holland Park. Some photographs of habitats were taken in Holland Park and Little Wormwood Scrubs.

It is suggested that future fieldwork should consist of making lists for each of the substrates listed during the current fieldwork, and that comparisons be made between these lists. This should give an accurate indication of any fluctuation in the lichen flora in the area. With the concern over the state of the atmosphere, this should provide very important information.

The current survey did also ask for information on bryophytes. Generally speaking, there is limited bryophyte habitat present and therefore bryophyte interest is not great. However, the survey did take place during the dry summer months, and for this reason, bryophyte records are probably not as comprehensive as they might be. It was certainly noted that, with the exception of *Orthotrichum affine*, there was very little bryophyte biomass on trees.

2. Survey Results

1. Holland Park

Holland Park consists conveniently of two distinct areas. There is the more open, southern part, and the more heavily wooded northern part. The northern part is on higher, more undulating terrain. There are also the gardens close to the offices to the west of the Park

1.1 Holland Park – the Southern Part

Lichens

On American Red Oak – *Quercus rubens*

There is a line of young trees on the east side of the playing field

Amandinea punctata
Flavoparmelia caperata
Lecanora albella
Lecanora chlarotera
Lecanora expallens
Lecidella elaeochroma
Melanelixia fuliginosa ssp. *glabratula*
Physcia adscendens
Rinodina oleae
Xanthoria parietina

On Ash

NB The *Caloplaca* species are more often seen on saxicolous habitats such as brickwork. They are present here on ash probably due to there being limestone dust in the atmosphere

Caloplaca flavocitrina
Caloplaca holocarpa agg
Scoliciosporum chlorococcum
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Xanthoria parietina

On Beech

Lepraria lobificans
Parmelia sulcata
Physcia adscendens
Punctelia jeckeri
Punctelia subrudecta

On Cherry species

Physcia adscendens
Scoliciosporum chlorococcum
Xanthoria parietina

On fencing made of worked wood

Phaeophyscia orbicularis
Physcia adscendens
Xanthoria candelaris agg.
Xanthoria parietina

On Horse Chestnut

Amandinea punctata
Phaeophyscia orbicularis

On Maple

Lecanora confusa
Lecanora expallens

On Mulberry

Phaeophyscia orbicularis
Xanthoria parietina

On Norway Maple – *Acer platanoides*

Candelariella reflexa
Lecanora chlarotera
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Punctelia subrudecta
Xanthoria parietina

On Plain Tree

Lepraria lobificans
Phaeophyscia orbicularis
Physcia adscendens
Punctelia subrudecta
Xanthoria parietina

Bryophytes – Mosses

On Norway Maple – *Acer platanoides*

On the base

Orthotrichum affine

1.2 Beside the Road to the East of the Southern Part of the Park

On Field Maple

Physcia adscendens
Physcia caesia
Xanthoria parietina

On Horse Chestnut TQ 2498 7979

Evernia prunastri
Flavoparmelia caperata
Hypotrachyna revoluta
Melanelixia subaurifera
Parmelia sulcata
Parmotrema perlatum
Physcia adscendens
Punctelia jeckeri
Punctelia subrudecta
Xanthoria parietina
Xanthoria polycarpa
Xanthoria ucrainica

On Laburnum

Candelaria concolor
Physcia adscendens
Punctelia subrudecta
Xanthoria parietina

On Lime

Candelaria concolor
Flavoparmelia soredians
Hyperphyscia adglutinata
Lecanora compallens
Parmelia sulcata
Physcia adscendens
Physcia caesia
Physcia tenella
Tephromela atra
Xanthoria parietina

On Sycamore

Diploicia canescens
Evernia prunastri
Flavoparmelia caperata
Melanelixia subaurifera
Parmotrema perlatum – not healthy
Physcia adscendens
Physcia dubia
Physcia tenella
Punctelia subrudecta
Ramalina farinacea
Xanthoria parietina

1.3 Brick Wall at the Southern edge of the Park

Lichens

Caloplaca citrina
Caloplaca flavocitrina
Lecanora albescens
Lecanora dispersa
Lecanora muralis
Lepraria lobificans
Melanelixia fuliginosa ssp. *glabratula*
Phaeophyscia orbicularis
Physcia caesia
Xanthoria parietina

Bryophytes – Mosses

Barbula unguiculata
Brachythecium rutabulum
Hypnum cupressiforme
Schistidium apocarpum
Tortula muralis

In the grass at the south western corner

Bryophytes – Mosses

Kindbergia praelonga

1.4 On a wall at the northern edge of the southern section

Bryophytes – Mosses

Bryum argenteum
Hypnum cupressiforme

Lichens

Lecanora muralis
Verrucaria macrostoma var. *furfuracea*
Verrucaria viridula

1.5 The Upper, Northern Section

Due largely to shading, the upper part of Holland Park is less rich in lichens than the lower. However there are some interesting species close to the Japanese Garden.

The golden barked Ash near the Japanese Garden

Amandinea punctata
Lecanora carpinea
Lecanora chlarotera
Physcia adscendens
Xanthoria parietina

On Strawberry Dogwood

Bryophytes – Mosses

Orthotrichum affine

Lichens

Amandinea punctata
Candelariella reflexa
Phaeophyscia orbicularis
Physcia adscendens
Physcia dubia
Physcia tenella
Xanthoria parietina

Rocks in the Japanese Garden

Amandinea lecideina
Candelariella aurella
Lecanora muralis (Abundant)
Xanthoria parietina

Bryophytes – Mosses

Tortula muralis

On Azalea

Physcia adscendens
Xanthoria parietina

On Ash

Amandinea punctata
Phsycia tenella
Xanthoria parietina

On the tulip tree

Of particular importance on this tree is a small amount (One thallus only) of *Pleurosticta acetabulum*. This is a species that appears to be in decline in South-eastern England. However, it has been found to be re-colonising trees in London following the atmospheric improvement. However, there is the slightest chance that the rich lichen flora on this tree was introduced with the tree when it was planted. However, most of the species are those that would be expected here. It is more probable that the nature of the bark is particularly conducive to the establishment of a healthy lichen population.

Amandinea punctata
Bacidia laurocerasi
Candelaria concolor
Candelariella reflexa
Evernia prunastri
Lecanora albella
Lecanora chlarotera
Lecanora compallens
Lecanora expallens
Melanelixia subaurifera
Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Pleurosticta acetabulum
Punctelia subrudecta
Ramalina farinacea
Scoliciosporum chlorococcum
Xanthoria parietina
Xanthoria polycarpa

On wooden fencing

Candelariella vitellina
Lecanora muralis

1.6 The Area of gardens around the offices to the west

This is an area of gardens with exotic trees, and more habitats to support bryophytes than elsewhere in the Park.

Corticolous

On Magnolia

There are several magnolia trees in this area, and the following is a list of species recorded on all of them.

Amandinea punctata
Flavoparmelia soredians
Lecania cyrtella
Lecanora chlarotera
Lecanora expallens
Melanelia subaurifera
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Punctelia subrudecta
Rinodina oleae
Xanthoria parietina
Xanthoria polycarpa

On Mop-headed *Robinia pseudacacia*

Amandinea punctata
Lecanora chlarotera
Physcia adscendens
Physcia tenella
Xanthoria parietina

Saxicolous

Lichens

On limestone

Caloplaca oasis
Caloplaca saxicola
Candelariella aurella
Candelariella vitellina
Lecanora campestris
Lecanora crenulata
Lecanora dispersa
Phaeophyscia orbicularis

On limestone topping of a brick wall

Candelariella aurella
Catillaria chalybeia
Lecanora campestris
Lecanora muralis

Bryophytes - Mosses

On limestone

Orthotrichum diaphanum

At the base of a damp, shaded wall

Bryophytes - Liverworts

Lunularia cruciata

On brick wall

Barbula convoluta
Bryum capillare
Bryum dichotomum
Tortula muralis

On Roof Tiles

Bryophytes – Mosses

Grimmia pulvinata

On a path

Hypnum cupressiforme

Lichens

Candelariella vitellina
Lecanora muralis
Xanthoparmelia mougeotii

Terricolous

In a flower tub

Bryum argenteum

2. **Avondale**

The lichens here are not very important, and most recorded are those that would be expected on any tree in the area.

On Ash

Hyperphyscia adglutinata
Lecanora chlarotera
Phaeophyscia orbicularis
Physcia adscendens
Xanthoria parietina
Xanthoria ucrainica

A Tree species resembling elm

Amandinea punctata
Phaeophyscia orbicularis
Physcia adscendens

On twigs of a hedge

Amandinea punctata
Candelariella reflexa
Xanthoria parietina

Bryophytes – Mosses

Orthotrichum affine

On Plane Trees

Lichens

Amandinea punctata
Candelaria concolor
Lecanora expallens
Lepraria lobificans
Phaeophyscia orbicularis
Physcia adscendens
Ramalina farinacea
Xanthoria parietina

Bryophytes – Mosses

Orthotrichum affine
Tortula laevipila

On Poplar species

Candelaria concolor
Phaeophyscia orbicularis
Physcia adscendens

On Robinia

Lecanora expallens
Phaeophyscia orbicularis
Physcia adscendens
Xanthoria parietina

On stone blocks

Lecanora muralis

On sycamore

Phaeophyscia orbicularis
Xanthoria parietina

On willow

Lecanora chlarotera
Phaeophyscia orbicularis
Xanthoria parietina

3. **Kensington Memorial Park**

The biomass of lichens here was impressive, especially on an avenue of poplar trees. Nothing that was particularly rare was found, however. The flora is characteristic of trees in an area where the atmospheric pH is high. All lichen flora observed was very recently established.

A Shaggy Parasol Mushroom *Lepiota rhacodes* was seen here in a flower bed.

On Ash, possibly *Fraxinus ornus*

This tree is surrounded by shrubs as it is in a flower bed. The following species were recorded:-

Candelaria concolor
Lecanora expallens
Lepraria lobificans
Phlyctis argena
Physcia caesia
Physcia tenella
Scoliciosporum chlorococcum
Xanthoria parietina
Xanthoria ucrainica

Poplar Avenue

Amandinea punctata
Candelaria concolor
Diploicia canescens
Lecanora albella
Lecanora chlarotera
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Scoliciosporum chlorococcum
Xanthoria parietina
Xanthoria polycarpa

Horse Chestnut Avenue

Amandinea punctata
Physcia tenella
Physconia grisea
Scoliciosporum chlorococcum
Xanthoria parietina
Xanthoria polycarpa

Bryophyte – Mosses

Tortula laevipila

On *Acer* species

Evernia prunastri
Parmelia sulcata
Physcia tenella
Xanthoria parietina

On an exotic *Acer* species

This tree is in the sunken garden area in a flower bed.

Candelaria concolor
Candelariella reflexa
Parmelia sulcata
Parmotrema perlatum – one healthy thallus
Physcia tenella

Bryophyta –Mosses

Dicranoweisia cirrata

On *Prunus* species

Physcia tenella
Xanthoria parietina

On wooden fencing

This fencing was on the edge of an area dedicated to mothers and young children.

Caloplaca citrina
Lecanora chlarotera
Micarea denigrata
Rinodina oleae

On a brick wall

Bryophyta – Mosses

Tortula muralis

On concrete post

Caloplaca holocarpa
Candelariella aurella
Catillaria chalybeia
Lecanora albescens
Lecanora dispersa

On iron fence post

Xanthoria candelaria

4. **Athlone Gardens**

The cherry tree species are interesting here, and support a more varied flora than many trees. This is possibly due to the acid nature of cherry bark which goes some way to countering the current tendency for a more alkaline atmosphere. 50% of the site is now being re-developed.

On Ash

These are a few ashes close to the entrance.

Candelariella reflexa
Lecanora chlarotera
Phaeophyscia orbicularis
Physcia tenella
Physconia grisea
Xanthoria parietina
Xanthoria ucrainica – locally dominant

Bryophyta – Mosses

Dicranoweisia cirrata

On Cherry species

These are planted in an avenue

Hypotrachyna revoluta
Melanelixia fuliginosa ssp. *glabratula*
Parmelia sulcata
Parmotrema perlatum
Physcia tenella
Punctelia subrudecta
Xanthoria ucrainica

On Horse Chestnut

Lecanora albella
Physcia tenella

On Maple species (*Acer)*

Lecanora chlarotera
Lecanora expallens
Parmelia sulcata
Physcia adscendens
Physcia caesia
Physcia tenella
Xanthoria parietina

Bryophyta – Mosses

Orthotrichum affine

On Whitebeam

Amandinea punctata
Physcia tenella

On Plane Trees

Several of these supported very little, or no lichen material

Physcia adscendens – particularly abundant
Physcia tenella
Xanthoria parietina

Bryophyta – Mosses

Tortula laevipila

On brickwork

Lecanora muralis

5. Emslie Horniman Pleasance Park

The quiet, sunken garden here supports some interesting species on sloping pebbles embedded in concrete. Otherwise, the poplar trees carry a good biomass of common species.

On cherry

Amandinea punctata
Candelaria concolor
Lecanora chlarotera
Physcia tenella
Xanthoria parietina

On Maple species (*Acer*)

Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Scoliciosporum chlorococcum
Xanthoria ucrainica

On Poplar

These are the large trees in an avenue beside one of the paths.

Candelariella reflexa
Phaeophyscia orbicularis
Physcia tenella
Physconia grisea
Lecanora chlarotera
Lecanora expallens
Rinodina oleae
Xanthoria parietina

Bryophyta – Mosses

Tortula laevipila

On Whitebeam

Lecanora chlarotera
Physcia tenella

In the quiet, sunken garden

On concrete

Collema auriforme

Bryophyta – Mosses

Tortula muralis

On pebbles

Caloplaca sp. – a simple, unidentifiable, infertile yellow stain
Catillaria chalybeia
Candelariella aurella
Collema tenax var. *ceranoides*
Lecanora albescens
Lecanora dispersa
Phaeophyscia orbicularis

Bryophyta – Mosses

Grimmia apocarpa

On sandstone rocks in the quiet garden

Candelariella vitellina
Phaeophyscia orbicularis
Lecanora dispersa
Lecanora muralis
Lecidea fuscoatra

The *Acer* avenue on the other side of the path from the Poplars

These trees are rather shaded and support very little lichen development, however on higher branches, there is a good biomass of lichen species mostly too high to identify. Only the following were definitely recorded.

Physcia tenella
Xanthoria parietina

6. Little Wormwood Scrubs

This area offers a considerable number of tree species as habitat for lichens. It is rather strange that the north east of the area, though relatively open and providing light, supports fewer lichens than elsewhere. The trees surrounding the central area are varied, and the species occurring on each tree species are listed. The scrub developing towards the north of the open area supports no lichens, and the rich, and mature grassland is too undergrazed to be of importance for either lichens or bryophytes. The lichen flora here is typical in an area where the atmosphere has a high pH, probably brought on by car exhaust. Even alder, a tree species which should have a very acid bark, supports a flora typical of high pH.

It was interesting that on willow especially, it was only the younger trees that supported lichens, the more mature being lichen free. It was also noted that several of the younger horse chestnut trees were diseased.

On Alder

Lecanora compallens
Lecanora expallens
Physcia tenella

On Ash

Amandinea punctata
Caloplaca citrina. agg. – Rare
Candelaria concolor
Candelariella reflexa
Diploicia canescens
Flavoparmelia soredians
Hyperphyscia adglutinata
Hypotrachyna revoluta
Lecanora chlarotera
Opegrapha vulgata – a tiny colony less than a half centimetre across
Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens – Very healthy and fertile
Physcia tenella
Physconia grisea
Punctelia subrudecta
Scoliciosporum chlorococcum
Xanthoria parietina
Xanthoria polycarpa
Xanthoria ucrainica

Bryophytes – Mosses

Orthotrichum affine

On Horse Chestnut

Candelariella reflexa
Flavoparmelia soredians
Hypotrachyna revoluta
Lecanora expallens
Melanelia fuliginosa ssp. *glabratula*
Melanelia subaurifera
Parmelia sulcata
Parmotrema perlatum
Physcia adscendens
Physcia tenella
Physconia grisea
Punctelia jeckeri
Punctelia subrudecta
Xanthoria parietina

On Lime

Amandinea punctata
Candelaria concolor
Candelariella reflexa
Cliostomum griffithii
Hypotrachyna revoluta
Lecanora expallens
Lecanora symmicta – on twigs
Lepraria lobificans
Melanelia subaurifera
Parmelia sulcata
Physcia adscendens
Physcia tenella
Punctelia subrudecta
Xanthoria candelaria

On Oak

Lecanora expallens

On Plane

Amandinea punctata
Lecanora chlarotera
Physcia adscendens
Physcia tenella
Xanthoria parietina

On Poplar

Candelariella reflexa
Cliostomum griffithii
Lecanora chlarotera
Lecanora expallens
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Physconia grisea
Xanthoria parietina

Bryophytes – Mosses

Brachythecium rutabulum
Kindbergia praelonga
Orthotrichum affine

On a wall

Bryophytes – Mosses

Grimmia apocarpa
Kindbergia praelonga

On Willow

Amandinea punctata
Candelaria concolor
Candelariella reflexa
Cliostomum griffithii
Hyperphyscia adglutinata
Hypotrachyna revoluta
Physcia tenella
Physcia adscendens
Physconia grisea – Rare
Punctelia subrudecta
Xanthoria parietina

Bryophytes – Mosses

Brachythecium rutabulum
Hypnum cupressiforme
Orthotrichum affine

7. **Westfield Park**

Although some of the lichen assemblages appeared to be in poor health, the lichens on *Prunus* trees, as during many parts of the survey included several species belonging to *Parmeliaceae* that are less tolerant of high pH, probably caused by ammonia in the atmosphere. These species are not included in the basic London list as shon at the beginning of this report.

The following species were recorded here:-

Corticolous species

On *Sorbus aucuparia*

Bryophytes – Mosses

Orthotrichum affine

Lichens

Lepraria lobificans
Phaeographis orbicularis

On *Prunus* species (Ornamental cherries)

These trees were mostly growing in an avenue

Flavoparmelia caperata
Flavoparmelia soredians
Melanelia fuliginosa ssp *glabratula*
Melanelia subaurifera
Parmelia sulcata
Physcia tenella
Physcia adscendens
Punctelia jeckeri
Punctelia subrudecta
Xanthoria parietina
Xanthoria ucrainica

On *Acer*

On at least one tree, the lichen biomass, consisting of common species, and mainly *Xanthoria parietina* was particularly high in the upper branches.

Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Xanthoria parietina

On *Populus albus*

Phaeophyscia orbicularis
Physcia adscendens
Physcia caesia
Physcia tenella
Xanthoria parietina

On *Tilia*

Phaeophyscia orbicularis
Physcia adscendens
Punctelia subrudecta
Xanthoria parietina

On *Acer pseudoplatanus*

Bryophytes – Mosses

Orthotrichum affine

Lichens

Candelaria concolor
Candelariella reflexa
Phaeophyscia orbicularis
Scoliciosporum chlorococcum

On *Robinia*

Amandinea punctata
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Xanthoria parietina

Saxicolous species

On concrete

Lecanora muralis

On stonework edging the lawn

Candelariella vitellina

On tarmac

Bryophytes – Mosses

Bryum argenteum

On lichens

Lecanora muralis
Verrucaria nigrescens

8. **Cremorne Park**

There are few trees in this park, but the wall separating it from the river which is made of concrete does support a range of species including *Caloplaca decipiens*, which is not common, but is most frequent in urban areas and towards eastern Britain. Also of interest are two recently planted saplings, which almost certainly carry species introduced with them.

Corticolous species

On *Fagus*

Physcia adscendens
Physcia tenella
Xanthoria parietina

On *Tilia*

Phaeophyscia orbicularis
Physcia adscendens
Xanthoria parietina

On *Sorbus*

This tree with narrow leaves is not a native. It has been recently planted, and the species it carries were probably introduced with it as its diameter is only a few inches.

Amandinea punctata
Candelariella reflexa
Lecidella elaeochroma
Physcia adscendens
Physcia tenella
Punctelia subrudecta
Rinodina oleae
Xanthoria parietina

Saxicolous species

On concrete wall above the Thames

This is a long stretch of wall, and a more prolonged study would certainly have added several more species to this list.

Bryophytes – Mosses

Grimmia pulvinata

Lichens

Acarospora sp. – not well enough developed to identify to species
Caloplaca citrina
Caloplaca decipiens
Caloplaca flavescens
Lecanora crenulata
Lecanora dispersa
Lecanora muralis
Phaeophyscia orbicularis
Physconia grisea
Rinodina oleae
Verrucaria nigrescens
Verrucaria viridula

Amongst paving stones

Bryophytes – Liverworts

Marchantia polymorpha

Bryophytes – Mosses

Barbula revoluta

Lichens

Collema tenax var, *ceranoides*
Lecanora muralis

On a brick wall

Candelariella vitellina
Lecanora dispersa (abundant)

9. **St Luke's Gardens**

These gardens surround St Luke's Church. The church is rather modern, and although not listed for lichens, there were few if any on it. Much of the gardens consists of a childrens' playground area. It was noticed that a hawthorn bush in the gardens was covered with soot as were lime trees. This soot no doubt dates back to a period of high industrial pollution.

Corticolous

On *Acer pseudoplatanus*

Physcia tenella

On *Populus albus*

Phaeophyscia orbicularis
Physcia caesia
Xanthoria parietina

On *Quercus*

Bryophytes – Mosses

Orthotrichum affine

Lichens

Phaeophyscia orbicularis
Physcia tenella
Lecanora expallens
Lepraria lobificans
Scoliciosporum chlorococcum

On *Crataegus*

Physcia adscendens
Physcia tenella
Xanthoria parietina

On *Tilia*

Physcia tenella

Saxicolous

On concrete blocks

Lecanora muralis

On stone blocks

Candelariella vitellina
Lecanora muralis

Records from the past relevant to the current survey

Jack Laundon, formerly of the Cryptogrammic Section of the Botany Department of the Natural History Museum published a paper in the Lichenologist Vol. 3 pp 277-327 in 1967 on the lichens of London. In this paper, he lists species found in Kensington and Chelsea as follows:-

Holland Park

Lecanora conizaeoides 1953, 1967

In 1953, just two patches were recorded on tree boles in the north of Holland Park. By 1967, there were fourteen patches recorded in the same area, though many were not fertile. Jack Laundon states that this shows some atmospheric improvement between the dates. It is also noted that there is an increase of green alga on trees in London parks. The presence of green alga (*Pleurococcus viridis*) indicates a pollution zone of 1 in a scale of 0 to 10 published by Professor David Hawksworth in *Air Pollution in Lichens*, Athlone Press 1973. This indicates a level of more than 170 parts per million of Sulphur Dioxide. The presence of the lichen *Lecanora conizaeoides* indicates Zone 3 and represents a level of about 150 parts per million. The presence of *Parmotrema perlatum* now present in several of the parks represents Zone 8 which indicates a sulphur dioxide level of about 35 parts per million, 30 parts per million being considered clean air. The species given as indicating clean air are all restricted to the west and north of Britain for other reasons. The presence of *Candelaria concolor* indicates eutrophicated bark, but also a sulphur dioxide level of less than 50 parts per million. This is now a common lichen in Kensington. The atmospheric problems in Kensington and Chelsea are now due to eutrophication as a result of the increase of ammonia in the atmosphere. The OPAL project is looking at this problem in areas that include the Borough. The main csource of widespread atmospheric ammonia, particularly in urban areas is as a result of variable efficiencies in the use of catalytic converters in car exhausts that convert NOX gases into ammonia for petrol and diesel fuelled vehicles. More recent catalytic converters have been developed that convert NOX gases to nitrogen and water, and this should cause an improvement.

Brompton Cemetery

Lichens recorded on limestone

Candelariella aurella	1956
Lecania erysibe	1960
Verrucaria nigrescens	1960

Lichens recorded on dead and decaying mosses on limestone

Cladonia chlorophaea	1956
Cladonia coniocraea	1956
Cladonia fimbriata	1960
Cladonia pyxidata	1956

Lichens recorded in the Borough, but exact location is not given

Lepraria incana Senso strictu
Lecanora dispersa
Lecanora muralis

Complete Species Lists – Site by Site

Number Totals

1. Holland Park

Corticolous Lichens	40 species
Saxicolous Lichens	19 species
Lignicolous Lichens	6 species
Corticolous Bryophytes	1 species
Saxicolous Bryophytes	12 species
Terricolous Bryophytes	2 species

2. Avondale Park

Corticolous Lichens	12 species
Saxicolous Lichens	1
Corticolous Bryophytes	2 species

3. Kensington Memorial Park

Corticolous Lichens	22 species
Iron Post Lichens	1 species
Lignicolous Lichens	4 species
Saxicolous Lichens	6 species
Corticolous Bryophytes	1 species
Saxicolous Bryophytes	1 species

4. Athlone Gardens

Corticolous Lichens	17 species
Saxicolous Lichens	1 species
Corticolous Bryophytes	3 species

5. **Emslie Horniman Pleasance Gardens**

Corticolous Lichens	9 species
Saxicolous Lichens	9 species
Corticolous Bryophytes	1 species
Saxicolous Bryophytes	2 species

6. **Little Worwood Scrubs**

Corticolous Lichens	30 species
Corticolous Bryophytes	4 species
Saxicolous Bryophytes	2 species

7. **Westfield Park**

Corticolous Lichens	17 species
Saxicolous Lichens	3 species
Corticolous Bryophytes	1 species
Saxicolous Bryophytes	1 species

8. **Cremorne Park**

Corticolous Lichens	9 species
Saxicolous Lichens	12 species
Saxicolous Bryophytes	3 species

9. **St Luke's Gardens**

Corticolous Lichens	7 species
Saxicolous Lichens	2 species
Corticolous Bryophytes	1 species

Species Lists

1. Holland Park

1.1 Corticolous

Lichens

Amandinea punctata
Bacidia laurocerasi
Caloplaca flavocitrina
Caloplaca holocarpa agg
Candelaria concolor
Candelariella reflexa
Diploicia canescens
Evernia prunastri
Flavoparmelia caperata
Flavoparmelia soredians
Hyperphyscia adglutinata
Hypotrachyna revoluta
Lecania cyrtella
Lecanora albella
Lecanora carpinea
Lecanora chlarotera
Lecanora confusa
Lecanora compallens
Lecanora expallens
Lecidella elaeochroma
Lepraria lobificans
Melanelixia fuliginosa ssp *glabratula*
Melanelixia subaurifera
Parmelia sulcata
Parmotrema perlatum
Phaeophyscia orbicularis
Physcia adscendens
Physcia caesia
Physcia dubia
Physcia tenella
Pleurosticta acetabulum
Punctelia jeckeri
Punctelia subrudecta

Ramalina farinacea
Rinodina oleae
Scoliciosporum chlorococcum
Tephromela atra
Xanthoria parietina
Xanthoria polycarpa
Xanthoria ucrainica

Bryophytes

Orthotrichum affine

Lignicolous

Lichens

Candelariella vitellina
Lecanora muralis
Phaeophyscia orbicularis
Physcia adscendens
Xanthoria candelaria agg.
Xanthoria parietina

Saxicolous

Lichens

Amandinea lecideina
Caloplaca citrina
Caloplaca flavocitrina
Caloplaca oasis
Caloplaca saxicola
Candelariella aurella
Candelariella vitellina
Catillaria chalybeia
Lecanora albescens
Lecanora campestris
Lecanora crenulata
Lecanora dispersa
Lecanora muralis
Lepraria lobificans

Melanelixia fuliginosa ssp *glabratula*
Verrucaria macrostoma var *furfuracea*
Verrucaria viridula
Xanthoparmelia mougeotii
Xanthoria parietina

Bryophytes – Liverworts

Lunularia cruciata

Bryophytes – Mosses

Barbula convoluta
Barbula unguiculata
Brachythecium rutabulum
Bryum argenteum
Bryum capillare
Bryum dichotomum
Grimmia pulvinata
Hypnum cupressiforme
Orthotrichum diaphanum
Schistidium apocarpum
Tortula muralis

Terricolous

Bryophytes – Mosses

Bryum argenteum
Kindbergia praelonga

2. **Avondale**

Corticolous

Lichens

Amandinea punctata
Candelaria concolor
Candelariella reflexa
Hyperphyscia adglutinata
Lecanora chlarotera
Lecanora expallens
Lepraria lobificans
Phaeophyscia orbicularis
Physcia adscendens
Ramalina farinacea
Xanthoria parietina
Xanthoria ucrainica

Bryophytes

Orthotrichum affine
Tortula laevipila

Saxicolous

Lichens

Lecanora muralis

3. Kensington Memorial Park

Corticolous

Lichens

Amandinea punctata
Candelaria concolor
Candelariella reflexa
Diploicia canescens
Evernia prunastri
Lecanora albella
Lecanora chlarotera
Lecanora expallens
Lepraria lobificans
Parmelia sulcata
Parmotrema perlatum
Phaeophyscia orbicularis
Phlyctis argena
Physcia adscendens
Physcia caesia
Physcia tenella
Physconia grisea
Scoliciosporum chlorococcum
Xanthoria candelaria
Xanthoria parietina
Xanthoria polycarpa
Xanthoria ucrainica

Bryophytes

Tortula laevipila

On Iron Post

Lichens

Xanthoria candelaria

Lignicolous

Lichens

Caloplaca citrina
Lecanora chlarotera
Micarea denigrata
Rinodina oleae

Saxicolous

Lichens

Caloplaca citrina
Candelariella aurella
Caloplaca holocarpa
Catillaria chalybeia
Lecanora albescens
Lecanora dispersa

Bryophytes

Tortula muralis

4. **Athlone Gardens**

Corticolous

Lichens

Amandinea punctata
Candelaria reflexa
Hypotrachyna revoluta
Lecanora albella
Lecanora chlarotera
Lecanora expallens
Melanelixia fuliginosa ssp. *glabratula*
Parmelia sulcata
Parmotrema perlatum
Phaeophyscia orbicularis
Physcia adscendens
Physcia caesia
Physcia tenella
Physconia grisea
Punctelia subrudecta
Xanthoria parietina
Xanthoria ucrainica

Bryophytes

Dicranoweisia cirrata
Orthotrichum affine
Tortula laevipila

Saxicolous

Lichens

Lecanora muralis

5. **Emslie Horniman Pleasance Park**

Corticolous

Amandinea punctata
Candelaria concolor
Lecanora chlarotera
Lecanora expallens
Phaeophyscia orbicularis
Physcia tenella
Physconia grisea
Rinodina oleae
Xanthoria parietina

Bryophytes

Tortula laevipila

Saxicolous

Lichens

Candelariella aurella
Candelariella vitellina
Catillaria chalybeia
Collema auriforme
Collema tenax var *ceranoides*
Lecidea fuscoatra
Lecanora albescens
Lecanora dispersa
Phaeophyscia orbicularis

Bryophytes

Grimmia apocarpa
Tortula muralis

6. Little Wormwood Scrubs

Corticolous

Amandinea punctata
Caloplaca citrina agg
Candelaria concolor
Candelariella reflexa
Cliostomum griffithii
Diploicia canescens
Flavoparmelia soredians
Hyperphyscia adglutinata
Hypotrachyna revoluta
Lecanora chlarotera
Lecanora compallens
Lecanora expallens
Lecanora symmicta
Lepraria lobificans
Melanelia fuliginosa ssp *glabratula*
Melanelia subaurifera
Opegrapha vulgata
Parmelia sulcata
Parmotrema perlatum
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Physconia grisea
Punctelia jeckeri
Punctelia subrudecta
Scoliciosporum chlorococcum
Xanthoria candelaria
Xanthoria parietina
Xanthoria polycarpa
Xanthoria ucrainica

Bryophytes – Mosses

Brachythecium rutabulum
Hypnum cupressiforme
Kindbergia praelonga
Orthotrichum affine

Saxicolous

Grimmia apocarpa
Kindbergia praelonga

7. Westfield Park

Corticolous

Bryophytes – Mosses

Orthotrichum affine

Lichens

Amandinea punctata
Candelaria concolor
Candelariella reflexa
Flavoparmelia soredians
Lepraria lobificans
Melanelia fuliginosa ssp *glabratula*
Melanelia subaurifera
Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Physcia caesia
Physcia tenella
Punctelia jeckeri
Punctelia subrudecta
Scoliciosporum chlorococcum
Xanthoria parietina
Xanthoria ucrainica

Saxicolous

Bryophytes – Mosses

Bryum argenteum

Lichens

Candelariella vitellina
Lecanora muralis
Verrucaria nigrescens

Cremorne Park

Corticolous

Lichens

Amandinea punctata
Candelariella reflexa
Lecidella elaeochroma
Phaeophyscia orbicularis
Physcia adscendens
Physcia tenella
Punctelia subrudecta
Rinodina oleae
Xanthoria parietina

Saxicolous

Lichens

Acarospora sp.
Caloplaca citrina
Caloplaca decipiens
Caloplaca flavescens
Candelariella vitellina
Lecanora crenulata
Lecanora dispersa
Lecanora muralis
Phaeophyscia orbicularis
Collema tenax var. *ceranoides*
Verrucaria nigrescens
Verrucaria viridula

Bryophytes – Liverworts

Marchantia polymorpha

Bryophytes – Mosses

Grimmia pulvinata
Pseudocrossidium revolutum

9. **St Luke's Gardens**

Corticolous

Lichens

Lecanora expallens
Lepraria lobificans
Phaeophyscia orbicularis
Physcia adscendens
Physcia caesia
Physcia tenella
Xanthoria parietina

Bryophytes

Orthotrichum affine

Saxicolous

Lichens

Candelariella vitellina
Lecanora muralis

Holland Park

Title: Holland Park
with notes from Simon Davey
Lichenological Survey 2011

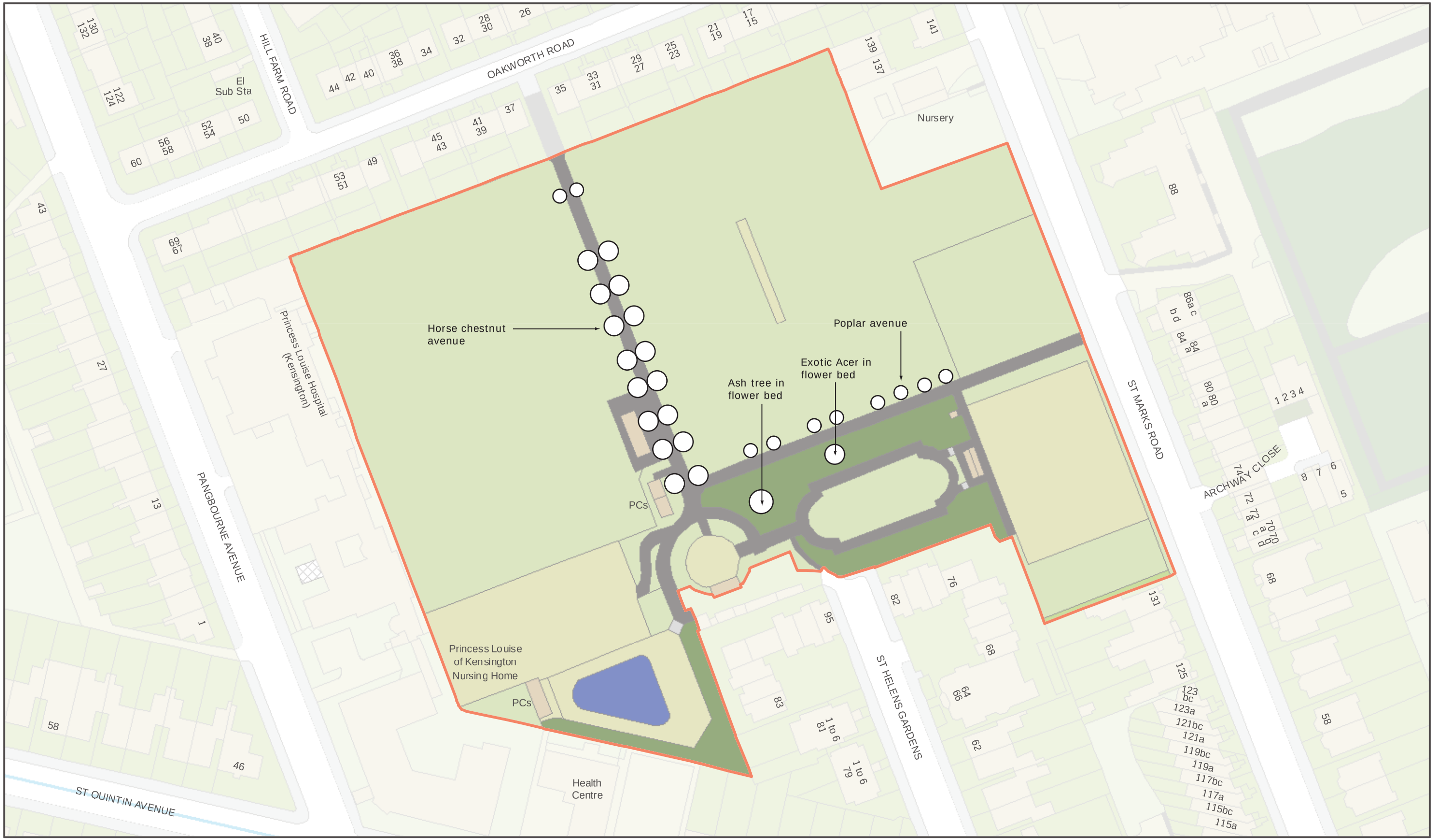
N

1:2,500

100 Meters

Ecology Service
The Royal Borough of Kensington and Chelsea
Holland Park Ecology Centre
0207 938 8185
saskie.laing@rbkc.gov.uk

Kensington Memorial Park



Title: Kensington Memorial Park
with notes from Simon Davey Lichenological Survey 2011

N

1:1,000

80 Meters

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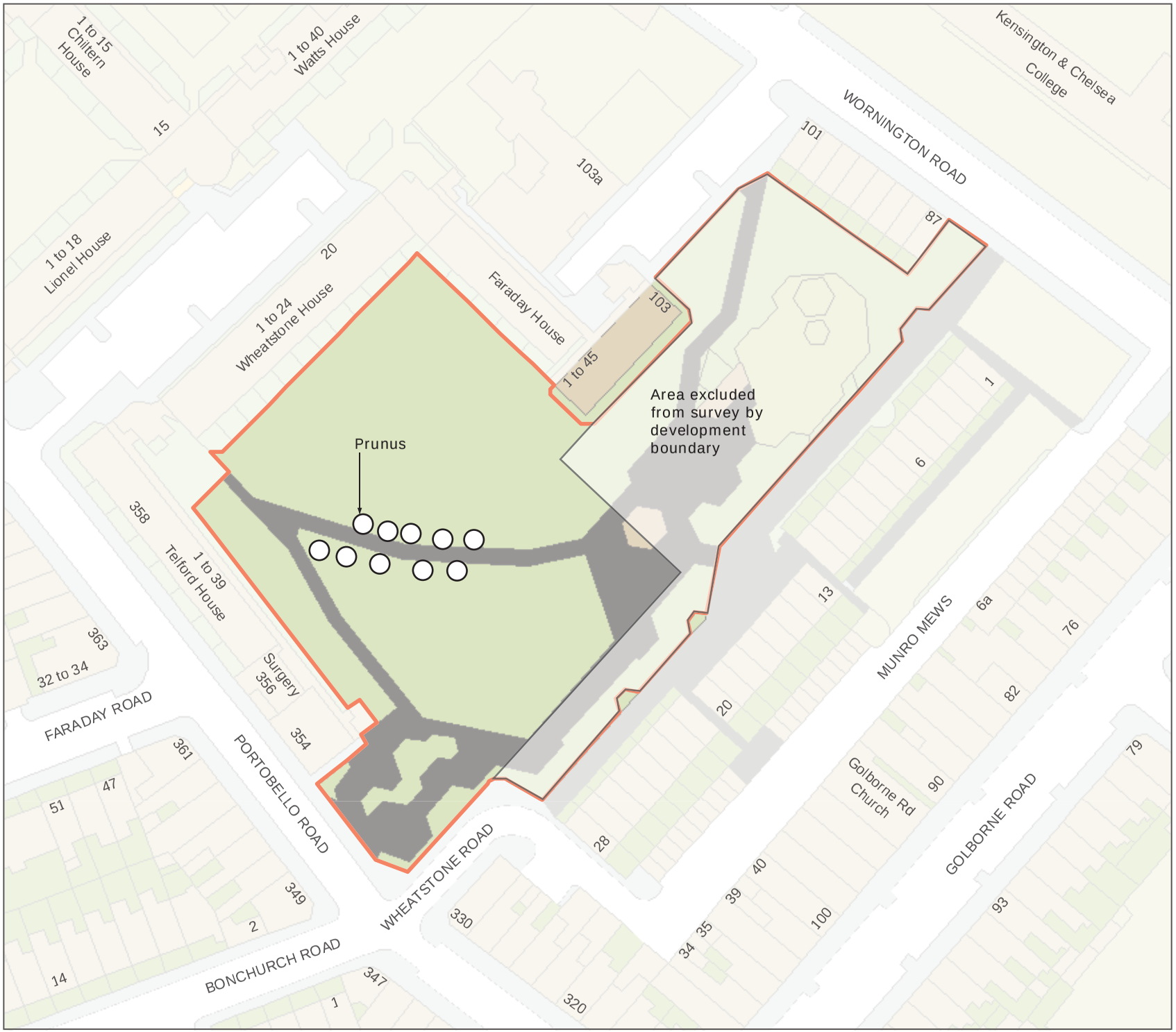
THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA

Athlone Gardens

with notes from Simon Davey
Lichenological Survey 2011



30
Meters

THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

Ecology Service
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Holland Park Ecology Centre
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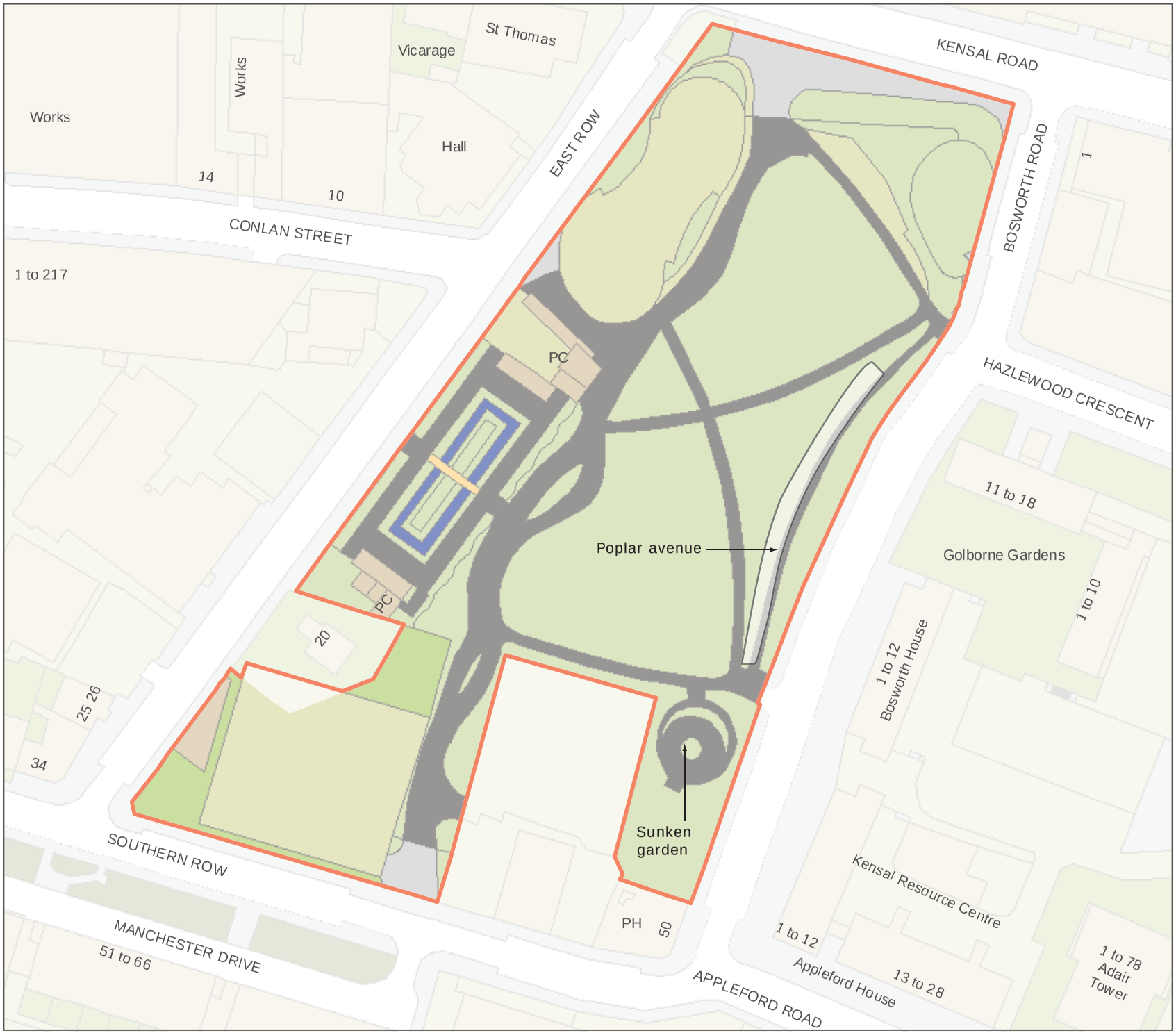
N

1:1,000



Emslie Horniman Pleasance

with notes from Simon Davey
Lichenological Survey 2011

25
Meters

THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

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N

1:1,000

Little Wormwood Scrubs

Title: Little Wormwood Scrubs
with notes from Simon Davey
Lichenological Survey 2011

N

1:1,500

75 Meters

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Holland Park Ecology Centre
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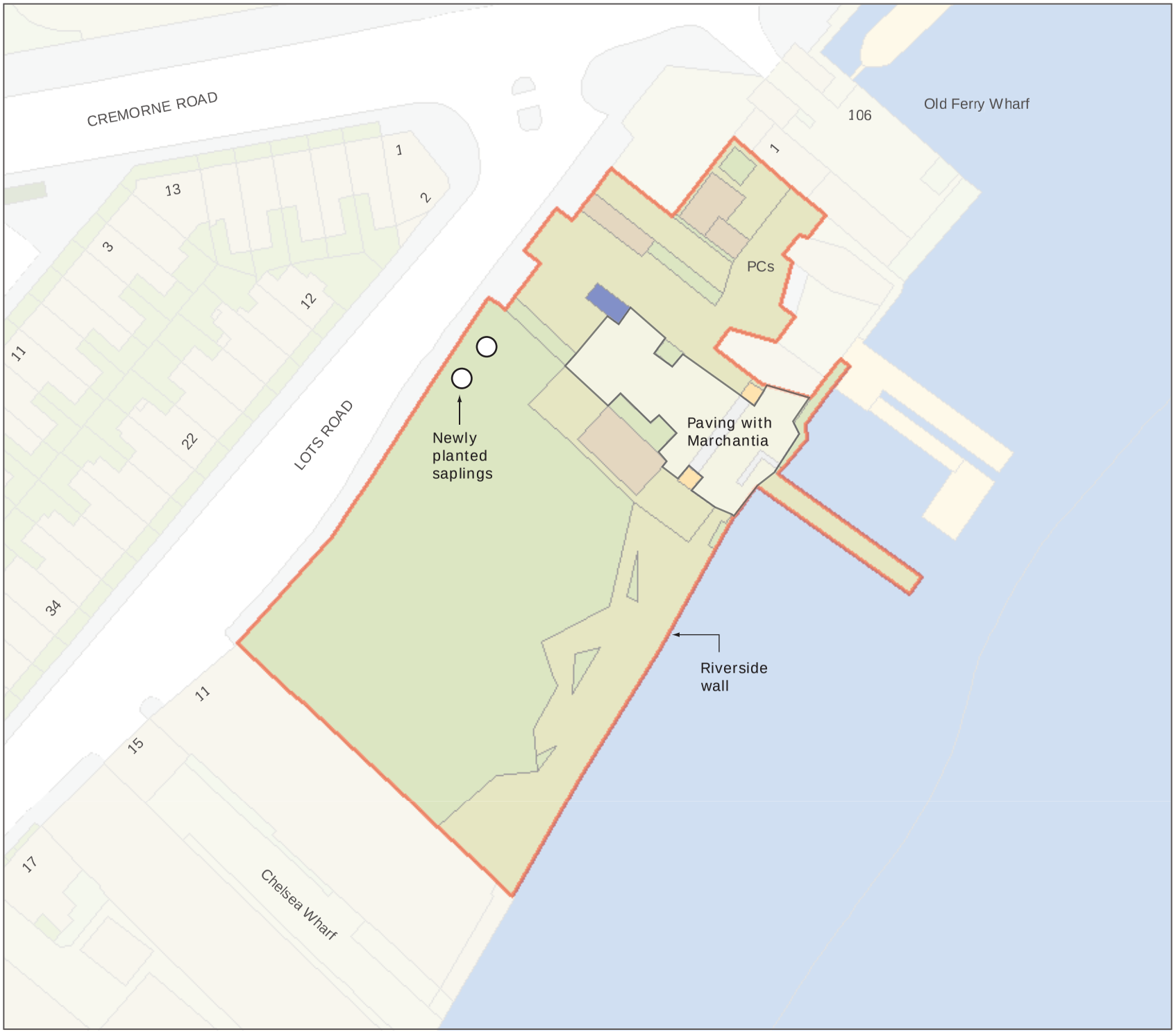
Cremorne Gardens

with notes from Simon Davey
Lichenological Survey 2011



20 Meters

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Holland Park Ecology Centre
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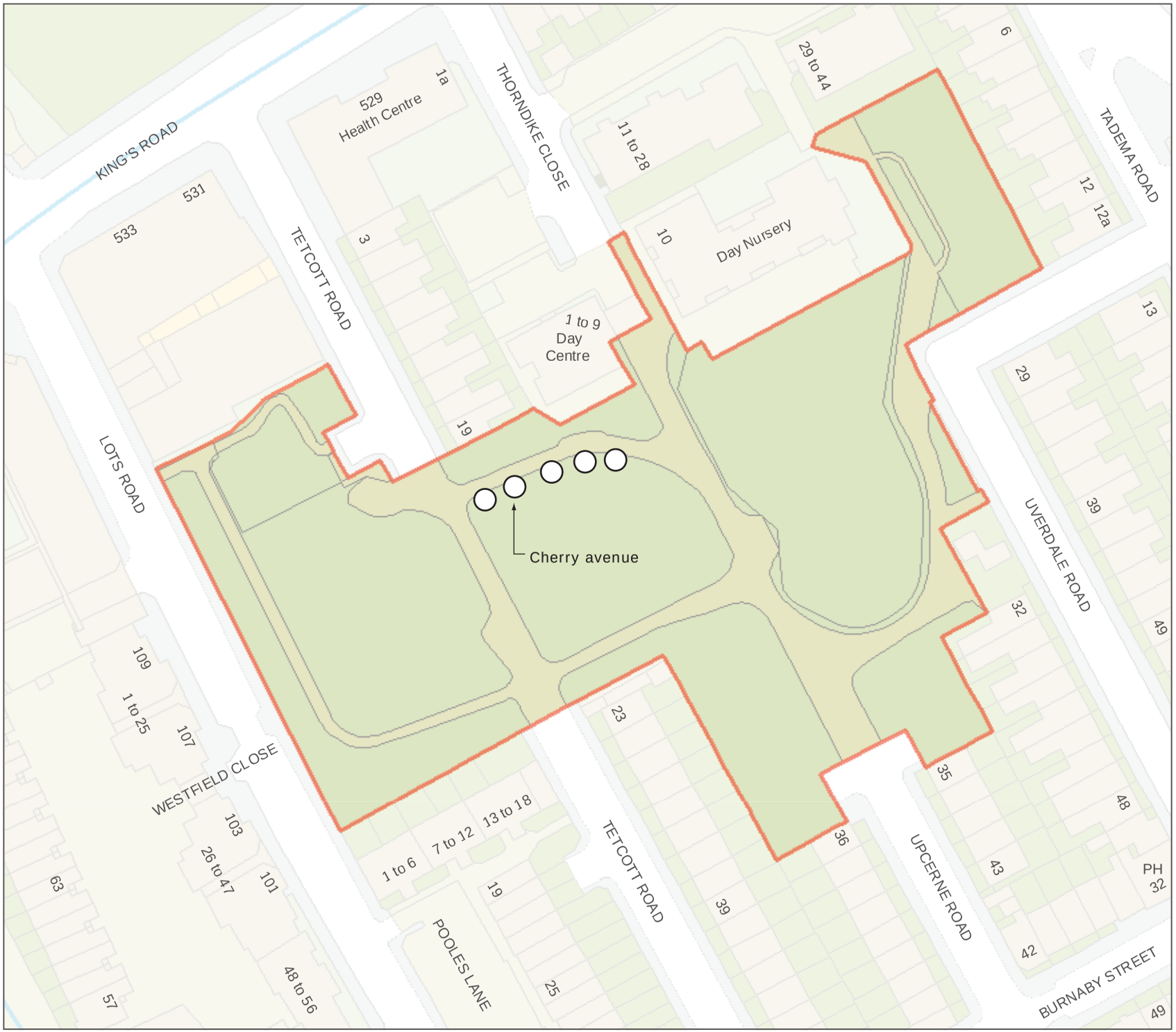
saskie.laing@rbkc.gov.uk

N

1:750

Westfield Park

with notes from Simon Davey
Lichenological Survey 2011



30
Meters

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AND CHELSEA

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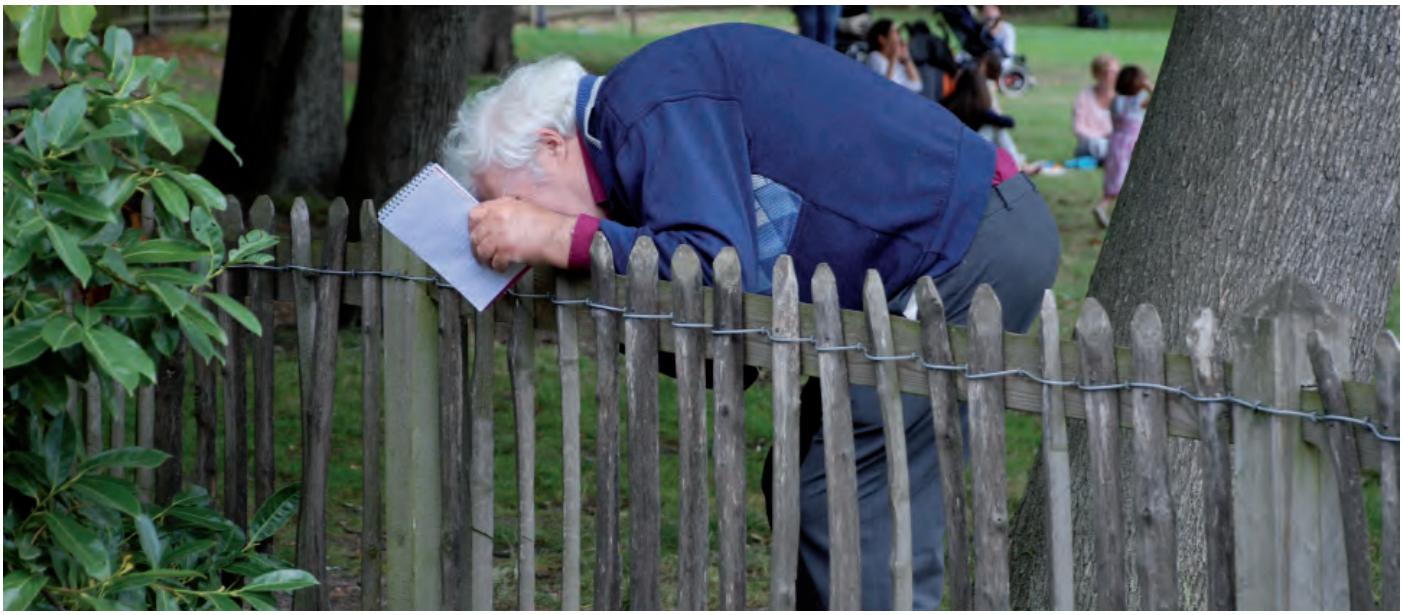
N

1:1,000

Avondale

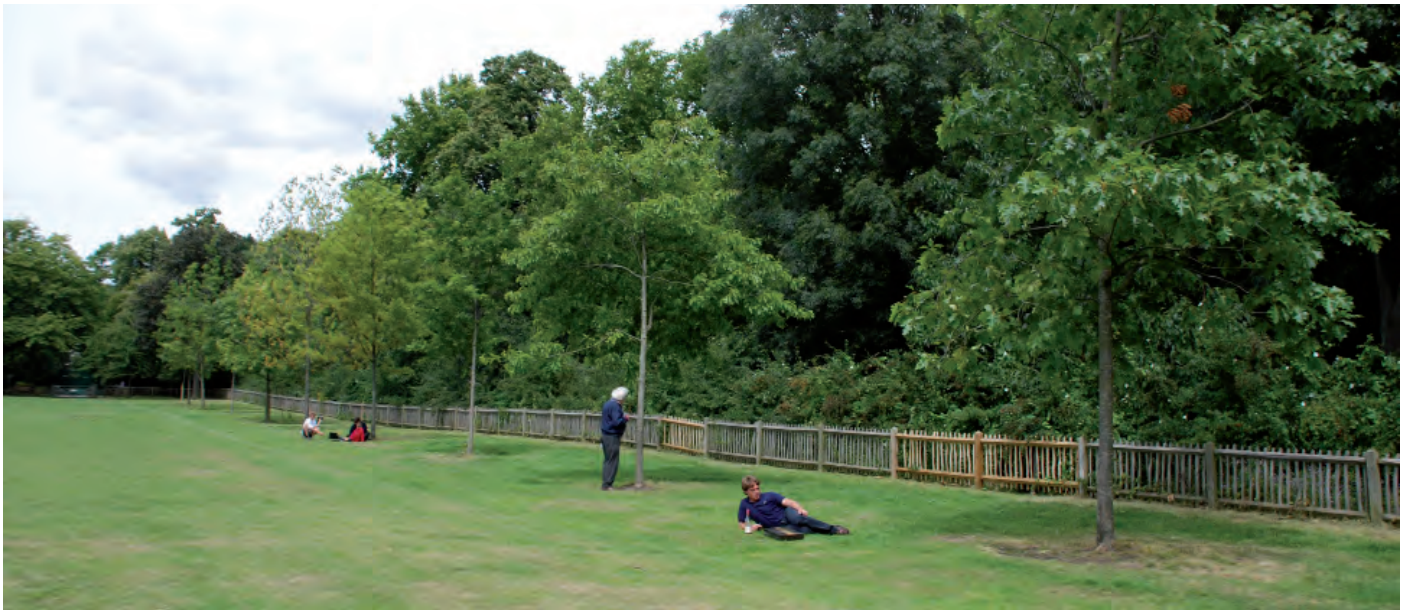
Photograph showing too much shade and ground cover for lichen development

Holland Park



Looking at lichens on fencing around sports field

Eastern Avenue



Red Oaks in sports field

Lichens and bryophytes on southern wall

Tulip Tree in Kyoto Garden. SRD pointing at *Pleurosticta acetabulum*

Pleurosticta acetabulum on Tulip Tree

Little Wormwood Scrubs

Western path

Western path