

Title: Arboricultural Impact Assessment: The view of St. Paul's from Waterlow Park

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By: David Houghton, Tree Manager

1. Issue

1.1. The purpose of the report is to conduct an Arboricultural Impact Assessment (AIA) against the tree maintenance suggested in the "The view of St. Paul's from Waterlow Park" report by the Trees and Views group on behalf of the Trust Advisory Group (TAG).

2. Background

2.1. A report produced on behalf of TAG by the Trees and Views group has been presented to Green spaces with the aim of exploring the possibility of reducing some specific trees in Waterlow Park to protect the view of St Paul's Cathedral from the top of the park. This would entail a variation from the established Council tree policy¹ on felling/pruning trees to retain a view.

2.2. The view TAG wishes to preserve is that of St. Paul's, and the London Skyline, next to the location of Sir Sidney Waterlow, which is being lost due to the encroachment of canopies from trees. In particular the Dawn redwood (*Metasequoia glyptostroboides*) by the lower pond, an oak (*Quercus robur*) to the right and a lime (*Tilia sp.*) to the left of the photograph on page 2 of the report.

2.3. Details of the suggested work are:

Tree	Work	Cycle
Dawn Redwood	Crown reduced and reshaped by approximately 25%.	4-5 years or 10 if a more substantial reduction is carried out.
Oak's	No work due to biodiversity value.	N/A
Lime	Crown reduce but extent not specified	4-5 years or 10 if a more substantial reduction is carried out.

Table 1 Proposed work

¹ <https://www.camden.gov.uk/documents/20142/5268201/Camden+trees+policy.pdf/ac911622-85ff-1d4c-a622-53e7ae71bcc2>

3. Location

3.1. An exact location of the trees was not provided, but using the dawn redwood as a reference point I have located the other 2 trees. The oak was easier to find in the landscape due to the low numbers in the park. However, the lime is more problematic as there are a number of contenders in the area, and I have had to make an educated guess on its location (see Figure 1).

3.2. Should the locations be incorrect I would encourage the trees and views working group to visit our [opendata²](#) webpages, which map all the trees in the borough and provide me with the correct locations.

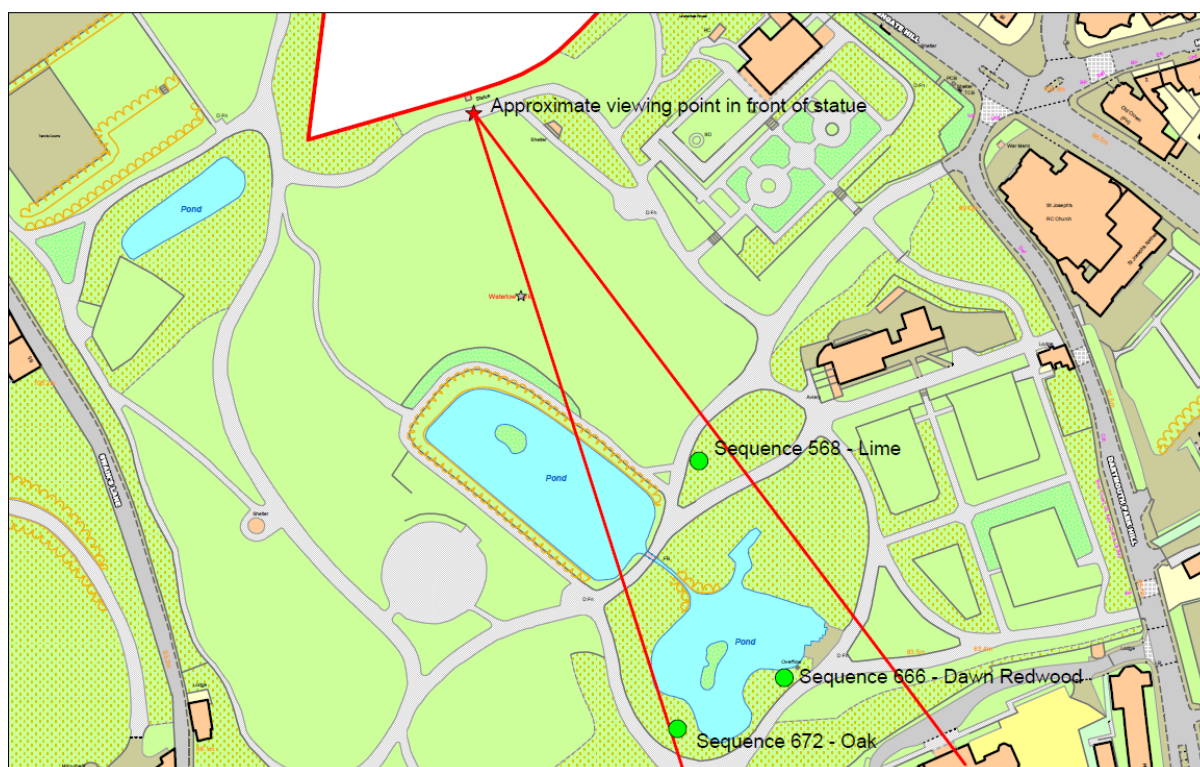


Figure 1 Estimated position of trees

4. Council managed trees

4.1. All Council managed trees are recorded in our asset maintenance database: Confirm Arboriculture. They managed in accordance with the Council's agreed tree policy and are inspected on a 3 year cycle by highly qualified tree officers,

² <https://opendata.camden.gov.uk/Environment/Trees-In-Camden-Map/p5w8-cdre>

who will assign work to the tree addressing any defects that are a health & safety concern.

4.2. The inspection records information about the height, spread, diameter of the trunk at breast height, maturity and physiological conditions of the tree. In addition to this we are able to calculate the Capital Asset Valuation of Amenity Trees³ (CAVAT) value for them. This is the cost of replacing that tree like for like.

4.3. In 2017 we commissioned Treeconomics to carry out an i-tree eco inventory survey of our entire tree stock. This reported on the ecosystem services (benefits) our trees provide to the public, such as, carbon storage, sequestration and pollution removal.

4.4. Details on the 3 trees implicated can be found in the table below.

Sequence number	Scientific Name	Common Name	Height (m)	Spread (m)	DBH (cm)	Maturity	Phys. Cond.	CAVAT	Total Carbon Storage (kg)	Gross Carbon Sequestration Per Year (kg)	Pollution Removal Per Year (g)
672	Quercus robur	Oak	20	14	152	Veteran	Poor	£224,322.54	5,784.70	14.5	532.6
568	Tilia europaea	Lime	24	8	62	Mature	Fair	£37,322.36	675.8	11.5	288.4
666	Metasequoia glyptostroboides	Dawn Redwood	22	6	93	Mature	Good	£83,975.32	1,264	15.6	202.5
Total								345,620.22	7,724.50	41.6	963.5

Table 2 Details of implicated trees

5. Condition

5.1. The lime and dawn redwood are in good health. However, the oak is a veteran tree with a large cavity and hollow trunk, which shows evidence of past fire damage and has been recorded as poor. Being a veteran tree it has high biodiversity value and provides a rarely found habitat locally outside of Hampstead Heath or Highgate woods.

6. Future growth

6.1. Dawn redwood is a fast growing tree and in their native range in China they can reach 28-35m in height. However, in the UK environment it is unlikely they will reach that, but they do exceed 25m tall in some UK arboretums. I would expect this tree to reach an ultimate height of between 25-30m.

³ <https://www.ltoa.org.uk/resources/cavat>

6.2. Common lime is a large tree and can reach 46m in ideal conditions. At present this tree is 24m in height and I would expect it to reach 30m in the future.

6.3. Both trees are likely to become more dominant in the skyline.

7. Effect of proposed work on Dawn redwood

7.1. The dawn redwood is a deciduous conifer, endangered in the wild, with a central leader that gives it a strong structural form that requires little maintenance. Reducing this by 25% will involve removing a portion of the top of the tree and it would be very hard to retain the conical shape, thereby reducing its amenity value.

7.2. Removing the top of this tree would result in the loss of apical dominance and the tree will try and replace the leader. This will result in a kink being produced in the leader as a new shoot tries to establish dominance over the rest of the crown. This shoot would be weakly attached and more at risk of failing in high winds. The close proximity of the tree to the decking means there will be a risk to the public and we will need to maintain this tree in a reduced form for the remainder of its life: 100-200 years.

7.3. The species is considered fast growing and it is likely pruning will result in a strong growth response. This could mean work would have to be repeated more regularly to retain the view, possibly on a 3 year cycle placing a financial burden on the council as Trustee of the park.

7.4. CAVAT and most ecosystem services are linked to leaf area, so you will see a 25% reduction in value and benefits provided by the tree. For CAVAT that will see a reduction in value of £20k. For carbon sequestration and pollution removal that will be reduced by 3.9kg and 50.63g respectively. That equates to the equivalent of 30.5 kilometres of driving that will not be absorbed by the tree per year⁴.

Benefit	Current values	Values after 25% crown reduction
CAVAT	£83,975.32	£818,581.49
Gross Carbon Sequestration Per Year (kg)	15.6	12
Pollution Removal Per Year (g)	202.5	151.88

Table 3 Effect of work on benefits

⁴ Based on the average CO₂ emissions of 127.9g for cars in 2019 -

<https://www.theguardian.com/business/2020/jan/06/uk-car-sales-brexit-diesel-electric-vehicles-emissions>

7.5. The effect of total carbon storage has not been calculated as the majority of carbon will be stored in the trunk and root system. Therefore, there is not the same correlation with the reduction in leaf area as the other 3 benefits.

8. Effect of proposed work on Lime

8.1. Lime is a deciduous tree and is tolerant of pruning, often kept in a reduced form in the urban environment or shaped (e.g. pleached⁵) in gardens to give a strong architectural form. The trees and view report does not specify the reduction to the canopy they would like to see. Therefore, I shall apply the same specification as to the dawn redwood.

8.2. Lime trees are often vigorous and exhibit a strong growth response to pruning. There are many lime trees in the borough that we maintain in a reduced form on a 3 year cycle or as part of our biennial reduction programme. In our experience crowns usually return to pre-pruning size within 2-3 years, so this work would have to be repeated on that cycle at cost to the council.

8.3. The reduction of the CAVAT and ecosystem services can be found in table 4. A reduction of this means equivalent of 22.5 kilometres of car journey carbon emissions will not be absorbed by this tree.

Benefit	Current values	Values after 25% crown reduction
CAVAT	£37,322.36	£27991.77
Gross Carbon Sequestration Per Year (kg)	11.5	8.63
Pollution Removal Per Year (g)	288.4	216.3

Table 4 Effect of work on benefits - lime

9. Landscape effect

9.1. Trees are a major landscape element of the park providing structure and texture, which work with the uniqueness of the site. They mark the seasons, provide habitat for wildlife and divide the site producing outdoor rooms.

9.2. To date the tree management in the park is carried out for risk or for nature conservation. This has created a very natural looking landscape and tree work without good reason should be avoided to maintain this.

⁵ Pleaching – intertwining of branches and trunks to form a hedge, archway, tunnel, or other decoration or functional asset. Gilman, E. F. (2012). *An Illustrated Guide to Pruning*. Delmar Cengage Learning.

9.3. The recent survey carried out by Friends of Waterlow Park referenced at A6 also asked the public what 3 things they most liked about the park - 83.8% listed Trees⁶. As part of the same question you could make a suggestion of what your favourite thing was and this is reported in the trees and views report: "Of 20 who did this, 8 said 'City Views' and 'Fantastic View of London'." There were 328 responses to the questionnaire, which means only 2.4% of those people asked rated the view as something they most liked about the park.

10. Conclusions

- 10.1. Carrying out the proposed work to the trees is likely to alter their shape and form. In particular, it will be very difficult to retain the conical form of the dawn redwood which will be detrimental to its amenity value.
- 10.2. The work will see a reduction in carbon sequestration and pollution removal by both trees. Although not quantifiable yet, the work required to maintain these trees in their reduced size will produce emissions and release carbon in to the atmosphere.
- 10.3. It is likely the work will need to be completed on a 3 year cycle to maintain the view and address the risk of weakly attached regrowth falling. This will add a financial pressure to the Council to carry out this work for the rest of the trees life.
- 10.4. Trees are highly valued by users of the park. Work that is not essential maintenance to address health & safety concerns or improve biodiversity could be viewed negatively by the public.

⁶ <https://survs.com/report/an9i3c6xhs>