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Hampstead Heath Consultative Committee	For Information	7 April 2014
Hampstead Heath, Highgate Wood and Queen's Park Committee	For Information	14 April 2014
Highgate Wood Joint Consultative Committee	For Information	30 April 2014
Subject: Tree Management Update Report		Public
Report of: Superintendent of Hampstead Heath		For Information
<p>Summary</p> <p>This report provides an update on significant emerging challenges facing the Tree Management Team on Hampstead Heath, Highgate Wood and Queen's Park. The report outlines the significance of the tree stock at all three sites, and also presents some of the new technology available to evaluate the environmental and economic value of this natural resource, against the background of growing concern for the natural environment and tree health.</p> <p>The report provides information on the current working arrangements and staff resource deployed to manage the tree stock across the Division, and then outlines the principal challenges facing the Tree Management Team, including tree disease and the increasing frequency of extreme weather events. It also includes proposed options for re-configuring the Tree Management resource to meet these new challenges.</p> <p>Recommendation(s)</p> <p>That the Highgate Wood Joint Consultative Committee notes the information provided in this report.</p>		

Main Report

Background and the tree stock

1. Trees and woodland are an essential component of the natural fabric of Hampstead Heath, Highgate Wood and Queen's Park. In landscape terms alone, these Open Spaces would be virtual deserts without tree cover. The presence of the treescape provides valuable habitat, incalculable amenity value, and recounts the history and heritage of the landscape. The recent proliferation of tree diseases and the huge public interest in this issue has precipitated a series of important changes, both in government policy and the manner in which the natural environment is valued, including trees and woodlands.

2. Hampstead Heath has a tree stock of approximately 20,000 trees, including 800 veterans and in excess of 100 hectares of secondary woodland, which has largely developed over the past 100 years. There are just over seven kilometres of hedgerows across the Heath and Heath Extension with many fine hedgerow trees, including a number of exceptional wild service trees. Much of the woodland trees are native oak, beech, willow and ash, but there are many other non-native species including the ubiquitous sycamore and turkey oak. Amongst all this woodland cover can be found previous planting schemes from various periods and many historically important landscape trees.
3. Highgate Wood has an estimated 5,000 trees within the woodland, and as an Ancient Woodland site contains many exceptional veteran hornbeams and standard oaks. Highgate Wood is one of a cluster of significant woodland sites in the Hornsey and Highgate area, and is a surviving fragment of the Bishop of London's Hunting Park that once extended to over 1,000 acres. Ancient Woodland experienced a period of decline following the Second World War, when many sites were partially clear-felled and then replanted with coniferous timber species. This followed what had already been a period of gradual land use change starting in the mid nineteenth century, during which woodland products were replaced with coal and steel.
4. Queen's Park has an interesting tree collection dating from the early Mackenzie planting of the late 1880's through to more recent native planting in the last five years. Unfortunately the site's principal tree species is the London plane closely followed by native ash, both being at the top of the current tree disease list. There are a number of other species, which provides some resilience, but there will be a need to plan for a long-term replacement programme if the current diseases threatening the London plane and the ash become well-established in the London area.

Evaluation of the tree and woodland resource

5. The past four years have seen an increasing focus on the Natural Environment, with growing concern about habitat degradation and the consequent decline in ecologically significant species. The massive opposition towards the planned selling of 250,000 hectares of publically owned woodland in February 2011 led to more than 500,000 people signing a petition opposing the proposal, together with a successful counter-campaign led by the Woodland Trust, resulting in the scrapping of the scheme. This coincided with the Government's 'Natural Environment' White Paper and subsequent policy document 'The Natural Choice' published in June 2011, which had been informed by the UK National Ecosystem Assessment. The UKNEA was the first assessment of its kind and highlighted not only the value of the natural environment in economic terms but also its vulnerability.
6. These milestone policy documents have been followed by others, notably the 'State of Nature' report collated by the UK Wildlife Trusts and released in the spring of 2013. This report identifies an overall decline of 60% of many wildlife species with associated decline in habitats. The report focuses on a number of principal habitats including woodland and identifies the decline in woodland management as a significant factor in falling numbers of insect and vertebrates species associated with this habitat. The report also refers to continuing degradation of hedgerow habitat on farmland and the loss of large hedgerow trees.

7. These national issues are reflected in the value and fragility of the natural fabric of Hampstead Heath, Highgate Wood, and Queen's Park, especially as these are sites completely embedded within the urban development of London. The combined tree stock at the three sites has an incalculable value both in landscape and environmental terms. Measuring this value is a complex and technologically challenging task, but there are various emerging technologies now available to measure and quantify the benefits of woodland and tree cover, both in an urban and a rural setting.
8. The system that appears to be attracting the most interest is a software package called 'i-Tree', which originated as a Forestry Service tool in the United States of America but has now been used extensively in the UK to produce detailed assessments of the 'ecological services' provided by urban forest environments. There are a number of different applications available from i-Tree, including a package to measure canopy cover and others for landscape design, but to date the most widely used application here in the UK is i-Tree Eco, which provides data on carbon sequestration, pollutant capture, and a capital asset value.
9. In 2011 a pilot study in Torbay in Devon used the i-Tree system to survey over 800,000 trees in the Borough and calculated that the Torbay 'urban forest' – a combination of park, woodland, street and privately owned trees – was worth a structural value of £280 million. This value represented the cost of replacing the entire treescape across the Borough. Other values provided by the survey were that the Borough's trees stored nearly 100,000 tonnes of carbon and sequestered 3,320 tonnes of carbon annually.
10. During the summer of 2014 an ambitious project co-ordinated by the RE-LEAF partnership will survey London's urban forest, using the i-Tree Eco package and a group of 200 trained volunteers. Having been processed in the USA, the collected field data will form part of a report to be published in 2015. This will be the first attempt to evaluate the ecological service benefit of London's tree cover, and will be a ground-breaking project which it is hoped the City of London can be part of. The London-wide survey will lead to more detailed Borough-wide assessments, and it is anticipated that the methodology will be applied extensively in the future to justify funding for tree and woodland management.
11. The London Tree Officers Association launched its own tree evaluation scheme in 2007: named Capital Asset Value for Amenity Trees (CAVAT), it hit the headlines with the £750,000 London plane in Berkely Square. The system has been used to great effect by London Tree Managers for countering insurance claims and compensation payments for tree damage. The Tree Management Team on Hampstead Heath has used the CAVAT system to calculate the value of individual landscape trees: a conservative valuation of the site's 400 London plane trees exceeds four million pounds.

The veteran tree stock

12. Hampstead Heath's stock of veteran-status trees has an asset value that is very difficult to calculate using any of the systems mentioned above. For such a concentration of trees of this age class and conservation value to have survived the urban expansion and development of the past 150 years is extraordinary in its own right. They are a collective living monument in central London to a lost rural landscape, and have an inestimable value for that reason alone. They are also an important reminder to current and future generations of the thousands of trees that were lost during the urban

expansion of the Victorian period in the surrounding area. In addition, their special conservation value for a suite of important wildlife species (including insects, bats, and fungi) means that their management and conservation remains a priority for the Tree Management Team. Veteran trees are particularly vulnerable to environmental changes, including soil compaction. Root zone protection and halo release are two of several minimal intervention methods the Tree Team employs to conserve these important trees.



Figure 1: Line of veteran trees near Spaniards Road

13. Highgate Wood also contains a fine collection of veteran coppice hornbeams, a number of which have never been accurately dated but could possibly be traced back to the late Medieval period. Highgate Wood also escaped Victorian development and provides a fascinating insight into the pre-Industrial Revolution landscape. Veteran trees require specialist management and carefully considered conservation techniques, with an emphasis on minimal intervention wherever possible and long-term planning. Fortunately this is an area of tree management that the UK, including the City of London, is notable for and for which it has acquired an international reputation as a leader in the field.

The arboricultural skills resource across the three sites

14. The four persons in the Tree Team are the only full-time arborists within the Division and offer a range of skills, from carrying out detailed tree inspections, and report writing to performing complex dismantling operations on large trees. The team has moved away from the traditional interventionist approach of previous tree-management practice to a more scientific method, which focuses on interpreting tree biology and understanding the pathology of fungi and their associated decay strategies. Central to its work is a founding principle of not felling trees unless absolutely necessary. The team has developed a particular specialism in veteran tree management which they are now exporting to other sites when they have the time, including Burnham Beeches. This move towards a more ecologically focused arboriculture fits

well with the other conservation and ecological work being carried out on the Heath and Highgate Wood.

15. Aside from the Tree Team, there are a number of staff who have arboricultural experience and are certificated to work with chainsaws. Most of these are members of the Conservation Team, who carry out a degree of ground-based tree work within their programmed conservation work. There are also three Wood Keepers within the Highgate Wood Team who undertake regular tree work within Highgate Wood, including climbing and Mobile Elevated Work Platform (MEWP) operations. There is the additional resource of the Heath Ranger Team, which has four experienced staff with arboricultural experience who can provide an emergency service at weekends and out of hours.
16. Queen's Park has no arboriculturally certificated staff, so is reliant on the full-time Tree Team carrying out tree inspections and tree safety works. There are a number of staff who have received basic tree-inspection training and have been very proactive in passing on information about potential tree problems.

Planned inspections and tree safety work

17. The Tree Team's core role is to survey and inspect trees at Hampstead Heath and Queen's Park, specifically in the high-risk areas such as highways, facilities, and neighbouring properties. These inspections are part of a tree management system, which the City of London has a legal requirement to have in place and implement as duty holders. The Tree Team now has three LANTRA-qualified inspectors, who provide a rolling programme of regular inspections covering some 3,400 trees within the most highly used areas on the Heath.



Figure 2: Vehicle traffic on Spaniards Road

18. These safety inspections require a high level of skill and a practised eye, and can only be carried out by suitably qualified staff. One of the advantages of using City of London staff for this work is that they often have a detailed and historical understanding of many of the trees and can put this to very effective use when carrying out annual inspections. This was well demonstrated in

August 2013 when a patrolling Heath Ranger (who also has the LANTRA tree inspection qualification and had previously worked for many years in the Tree Team) identified a structural fault on a roadside oak tree. The area was rapidly cordoned off and cars and public were excluded from the fall zone, preventing serious injury when part of the tree collapsed and fell into the road shortly afterwards.

19. The cyclical inspection work is recorded on a tree management database called Arbortrack, and trees identified for safety work are then listed according to priority and worked on by the team. In 2013 alone, the team worked on 120 individual trees, including veteran trees. The schedule of trees requiring work is growing progressively longer as additional works are added due to storm events and emergency work.

The growing threat of tree disease and impact on workload

20. The current and continuing proliferation of tree diseases is causing a great deal of concern across the tree-management industry, with the additional separate issue of imported insect pests. Currently the diseases and pathogenic insects causing greatest concern are Ash Dieback, Oak Processionary Moth, and Massaria of Plane. In addition there are well-established diseases that have already reduced the tree stock significantly, specifically Horse Chestnut Bacterial Canker at Queen's Park and Chronic Oak Decline at Highgate Wood. Sadly most of these diseases have been introduced by human activity and it seems that despite all the plant import legislation and controls on movements, the diseases have moved throughout the UK.
21. When it comes to spreading plant pathogens, the rapidity of the spread of Ash Dieback in the autumn and winter of 2012 demonstrated just how effective we are at doing Nature's job for her. There has been a great deal of discussion about the way the Ash Dieback outbreak was dealt with in 2012, and how we should learn from the mistakes that were made in the 1970s and 1980s with Dutch Elm Disease. Although Ash Dieback was not discovered in the London area in 2013, it is expected to arrive in the next two years and the disease will have a major impact if it becomes established at Hampstead Heath and Queen's Park, where there are significant populations of ash trees.
22. In the spring of 2012 the fungal disease Massaria was discovered in Queen's Park, then identified shortly afterwards in various locations on Hampstead Heath, including high footfall areas such as South End Green and along the London Overground line boundary to the north of the Lido. It was very quickly realised that this issue needed to be given the highest priority and, with guidance from other tree managers in Royal Parks and neighbouring Boroughs, measures were put into place to manage the risk, including identification and removal of infected tree limbs and a raised frequency of inspection.
23. The immediate impact of this increased inspection frequency is the Tree Team has had to reschedule a significant amount of its time for carrying out essential safety work on the London planes. Inspections are carried out twice a year, as the pathology of the fungi involved can cause a rapid degenerative decay leading to branch failure within a short time. Once suspected branches are identified, the trees in question have to be climbed and the affected limbs removed. Because many of these trees are large 100-year-old landscape trees with high canopies exceeding 20 metres, the climbing operations involved are time consuming.

24. Between Hampstead Heath and Queen's Park the Tree Team is now having to deliver additional inspections of some 500 London planes, which is taking up a significant amount of their operational working time. The London Tree Officers Association has now released a comprehensive guidance document on managing Massaria on urban plane trees and this document will be adopted for future management of the disease.
25. Oak Processionary Moth is a pest that was introduced with imported oak trees from mainland Europe in 2006. Since then it has become well-established in South West London and has spread progressively every year. The caterpillars colonise oak trees, feeding on the leaves and, following a series of life cycle stages, build silken nests to pupate in. There is a major public health issue with Oak Processionary Moth, as the larval caterpillars produce microscopic allergenic hairs that can produce rashes and respiratory problems in humans and animals. The caterpillars can also cause significant damage to host trees, especially those already under stress, and young trees.
26. Oak Processionary Moth has been the target of a concerted programme of eradication financed by central government through the Forestry Commission, with the objective of stopping the pest from spreading further out into other parts of London. Last summer 150 known sites in and around London were treated with insecticide, and the operation has been considered to have had a significant impact. The Tree Management Team is working closely with the Forestry Commission and other organisations such as the London Tree Officers Association, in order to obtain the best advice and support in controlling this pest in the event of an infestation.
27. Should an infestation occur on any of the sites, the Tree Manger will seek advice from the Forestry Commission control team and then contract one of the designated specialist firms to carry out pesticide spraying. If the infestation is over a wide area, it is possible the public may have to be excluded for significant periods. Oak Processionary Moth is a notifiable pest and must be reported to the Forestry Commission and DEFRA. Latest news from the Forestry Commission suggests that the caterpillars progress eastwards has slowed, and instead is heading in a south-westerly direction – this hopefully means the danger is less imminent but nevertheless we have to be prepared. The Tree Management Team is continuing to carry out biosecurity measures by monitoring trees for signs of infestation.
28. Working with other organisations to share and exchange information on tree disease is essential, and the Conservation and Trees Manager is now part of a Pest and Disease Working Group, a small group of tree professionals that has been set up by the London Tree Officers Association who will meet regularly to discuss current issues. Information arising from these meetings can then be circulated to the City of London's Departmental Tree Disease Working Group. The Tree Management Officer is also attending a small specialist working group focusing on Massaria.

Storm damage and increasing extreme weather events

29. The Tree Team has maintained a simple database of tree incidents since the beginning of 2008, and the entries are an interesting indication of the impact of extreme weather events. The table below sets out the reported tree incidents and those that were storm-related. There is an interesting 'quiet' period between 2010 and 2011, which has added to the perceived impression of a sudden significant increase in tree incidents.

Year	No of Tree Incidents	Storm related
2008	66	0
2009	75	6
2010	50	0
2011	58	0
2012	80	37
2013	300	225

30. The St Jude's storm event was probably the worst extreme weather event that the Tree Management Team has had to deal with in the past twenty years, the previous severe storms being the 1987 and 1990 events that caused extensive damage across the southern part of the UK. The storm on the 28th October 2013 was not comparable to the ferocity and scale of the 1987 Hurricane but still caused extensive damage. Hampstead Heath was left with over 100 damaged trees, of which 40 were too badly damaged to save.
31. The immediate priority works that followed the St Jude's storm meant that the Tree Team was committed to almost a month of extra work, resulting in some disruption of their normal work schedule. Fortunately both the Heath Ranger Team and the Conservation Team were able to provide a professional and highly effective auxiliary task force, which focused on felling those trees too badly damaged to be retained as well as removing and processing all the fallen branch debris. This allowed the Tree Team to focus on the more technically difficult dismantling operations and those that required climbing work.
32. Highgate Wood appeared to have the highest number of damaged trees at 120, but this was mostly canopy damage. The large number of damaged but still suspended branches necessitated closing the site for two days for public safety reasons, which allowed the Highgate Wood Team to focus on making safe the pathways and more frequently used areas. The Tree Team and the Conservation Team provided additional support in Highgate Wood for a number of days to tackle several of the more challenging jobs.
33. In total the St Jude's storm deflected sixteen staff away from their programmed work for a period approaching six weeks. We are incredibly fortunate to have the additional resource of fourteen staff with arboricultural experience and certification. The fact that there was no requirement to bring in any external resources, other than a hydraulic work platform, proves the professionalism and combined experience of the staff and Management Team.

The Ponds Project and impact on trees on or near dams

34. For the past two years there has been an ongoing programme of tree management on the principal dams in both the Highgate and Hampstead chains. These works have focused around the recommendations made by the Reservoir Engineer, and have largely been carried out by the Conservation Team. However there are several trees that have also been worked on by the Tree Team, and there is now an additional requirement to ensure that all the significant trees located on the dams are inspected annually, in order to ensure that structural issues are identified before these trees can cause any damage to the dam and causeway structures.



Figure 3: Plane trees at Hampstead No.2 pond

35. There is also the important consideration that with the progress of the Ponds Project and the inevitability of some degree of tree loss when the works take place, there will be some requirement for the City of London's Tree Team to carry out some of the more sensitive work. It will also be required to handle any works to veteran trees in the construction areas, and ensure that tree protection measures are adhered to.

Successional issues within the arborist resource

36. Despite the number of available staff with arboricultural training and experience, there is a developing issue with climbing fitness and increasing age within the climbers group. Of the fourteen climbers across the Highgate Wood, Conservation and Trees Section, there are a number who are infrequent climbers, while some are approaching an age where climbing fitness and agility are diminishing. Climbing requires a high degree of physical fitness and regular practise. Despite the new ascending systems and cross-over from rock climbing technology, the work still requires fitness and stamina. Climbing arborists are also more susceptible to musculo-skeletal injuries, due to the nature of the work, and such injuries often mean long periods off work recovering, which then disrupts programmed work and service delivery.
37. There was a very well-received physiotherapy course run at Epping Forest in the summer of 2012 specifically for arborists across the Open Spaces Department. Everyone who attended had an individual assessment and the feedback was very positive. What really struck those who attended was the attention to detail, the recognition that the job of being a climbing arborist is very physically demanding and that as a group, they merit additional support. Unfortunately this service is longer provided by Occupational Health.
38. There is a growing need to replenish the climbing group with new, younger staff in order to maintain a reasonable level of fitness, and thus allow the older members of the group to focus on less physically demanding tasks, such as inspections and working off a hydraulic platform. There is currently no

apprenticeship scheme in place at Hampstead Heath, though the feasibility of employing an arboricultural apprentice is under investigation.

Making more effective use of the arboricultural skills across the Division

39. The events of the last two years have led the Tree Management Team to reconsider the existing model for arboricultural services in this Division. Previously the solution to the problem would have been to contract in additional resource, whether that was to assist with the tree inspection work or to carry out works on trees, particularly those on highways. Due to the increasing constraints on budgets, this option is becoming more difficult to justify, especially when we have a significant arboricultural resource on-site.
40. The Management Team is now looking at a more flexible lateral approach to delivering an effective and professional arboricultural service, much of which has to some extent already been tested during the recent season of storms. This new model will involve making more effective use of the high level of expertise and knowledge that exists within the Conservation and Ranger Teams. Both these teams have a number of staff who previously worked on the Tree Team and have a wide range of arboricultural skills, from mechanical winch operators to professional tree inspection.
41. Plans are now underway to deploy some of these staff to work alongside the Tree Team, either as a separate unit to work on specific trees that suit their particular skill sets, particularly large fallen trees, or to provide additional support for the Tree Team when they require skilled ground staff. Clearly this new model of working will require careful consideration, as it will impact on other areas of service delivery, so timing and deployment planning are critical.
42. The Tree Team currently operates as a single unit using one vehicle. In order to maximise their effectiveness, they require another vehicle that can be used by the tree inspection group, but could also be used by a small secondary team. In partnership with the Department of the Built Environment, a Land Rover 110 Pickup used for gritting and highway inspections during the winter months will be available to the Tree Team from April to October. The cost to the Superintendent is fuel and a six-month service at the end of the loan period, which will be met from the local risk budget.
43. It is vitally important to continue the work maintaining and conserving Hampstead Heath's population of veteran trees. The Tree Team and the Conservation Team have been able to carry out some significant work on a number of veteran trees over the course of the past year, but due to the storm events have understandably had to divert their attention to safety work. With the new working arrangements to be implemented from April onwards, there will be a schedule of veteran tree work to be carried out in 2014, which the Teams will strive to complete.

Corporate & Strategic Implications

44. Tree Management contributes to producing a Clean, Pleasant and Attractive City (Objective CPAC4) and to Conserve and Protect Biodiversity (Goal 15) in the Community Strategy. It will also help fulfil the Department's Strategic Goals and Objectives: **No. 2.** To adopt sustainable and sensitive working practices, promote biodiversity and protect the Open Spaces for the enjoyment of future generations, and **No. 5.** To ensure that the profile of the Open Spaces is further recognised through working in partnership with others

to promote our sites and through influencing policies at a local, regional and national level.

Implications

45. There are no anticipated financial implications resulting from this report.

Conclusion

46. The tree management resource at Hampstead Heath, Highgate Wood and Queen's Park is taking on a heightened role following the challenges outlined above. Tree Managers have had to deploy available resources away from other important areas of work, such as the ongoing programme of conserving veteran trees, in order to focus on essential Duty of Care requirements. Unfortunately the threat of tree disease is likely to continue, with new pathogens being introduced and released into the environment requiring increased biosecurity measures. The recent spate of major storm events has caused disruption to programmed work and meant that all available arboricultural resources have been focused on public safety considerations. However it is important to remember that these are challenges faced across the rest of the country, with the same decisions having to be made by other Tree Management professionals everywhere. The City of London is in the unusual position of having a well-resourced internal arboricultural service. At North London Open Spaces, the focus over the next few months will be the re-evaluation of the available arboricultural resource within the Division and the reconfiguration of the existing teams to meet these pressures.

Appendices

- None

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