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| Committee(s) | Dated: |
| Hampstead Heath Consultative Committee – For Information | 9 March 2015 |
| Hampstead Heath, Highgate Wood and Queen’s Park Committee – For Information | 23 March 2015 |
| Subject: Update on Tree Safety Management at the North London Open Spaces Division | Public |
| Report of: Superintendent of Hampstead Heath | For Information |

Summary

This report provides an update on Tree Safety Management across the North London Opens Spaces Division. In March 2014 a report was presented to the Hampstead Heath Consultative Committee on Tree Management, and the Committee made a request for an additional report to be presented focussing on tree safety. This report provides information on tree risk management guidance, the tree inspections process, tree incident reporting, tree health, and external review. In addition, the report provides information on the current practices the Tree Team employs to manage the tree stock across the Division, specialist training and information gathering.

Recommendation

Members are asked to:

- Note this report.

Main Report

Tree Inspection process and Industry Guidelines

1. The total Divisional tree stock across Hampstead Heath, Highgate Wood and Queen’s Park is approximately 25,000 trees. It would not be practicable to inspect every single one of these trees, as there is not sufficient resource to do this. The Health and Safety Executive advise adopting a zoning approach for those landowners who manage a large number of trees. In 2007 a Section Minute was released into the public domain by the HSE that prescribed using a two-tier or two-zone system, which would simply divide those trees into high-target areas, such as highways and close to buildings, and low-target trees growing in less-frequented areas such as woodlands. This approach has now been adopted widely by organisations such as the Royal Parks Agency and the National Trust, and by the City of London. The two-zone system should be considered the minimum, and most practitioners adopt a three- to five-zone system.
2. Part of the problem that Tree Managers face is the absence of any form of clear industry guidance or standard. Other than the Health and Safety Executive’s Section Minute mentioned above, there is no accepted guidance document that establishes a standard for all to follow. In 2007 the National Tree Safety Group (NTSG) was established to investigate the feasibility of drafting a British Standard in Tree Risk Management. This would follow a number of other Tree Management British Standard (BS) documents, including BS:5837 and BS:3998

which deal with trees and development and with arboricultural operations respectively. The NTSG spent considerable time and effort in producing a draft standard known as BS:8516, and a specialist separate BS group was set up to draft a document that was sent out for consultation in 2008. The document was widely commented on but met with extensive criticism and ended up being dropped.

3. Fortunately the NTSG continued as a group and produced instead a guidance document 'Common Sense Risk Management of Trees', which following public consultation was released in December 2011. This publication was widely praised by the industry, and also sanctioned by the HSE. Published by the Forestry Commission, the document has now been adopted by many organisations across the Tree Management Sector. In June 2014 the City of London produced its own Tree Safety Policy, which refers directly to the NTSG guidance. This document was adopted by the Open Spaces Committee in June 2014. The NTSG guidance is founded on five key principles:

- Trees provide a wide variety of benefits to Society.
- Trees are living organisms that naturally lose branches or fall.
- The overall risk to human safety is extremely low.
- Tree owners have a legal duty of care.
- Tree owners should take a balanced and proportionate approach to Tree Safety Management.

4. The NTSG guidance document is made up of five chapters, with key sections on the risks from trees, legal requirements, reasonable and balanced tree management, and how to apply the guidance. The document is aimed at all levels of tree ownership, from large organisations right down to small landowners.

Tree risk quantified

5. The key message to convey to all our visitors and staff is that the risk posed by trees shedding branches or collapsing is very low. The Health and Safety Executive website publishes statistics on injuries and fatalities attributable to trees, in both the Forestry and Arboricultural sectors. The generally accepted average figure for related deaths remains at six occurrences per year, although this does fluctuate. It is significant that the number of fatalities of arboricultural workers is also around six occurrences every year, which gives an indication of the level of focus on tree management.
6. The HSE suggest a threshold of risk management of 1:10,000, where any risk above this level is regarded as unacceptable and must be addressed. The 'Tolerable Risk' region extends from 1:10,000 to 1:1,000,000. The risk from trees is calculated to 1:10,000,000 and is therefore considered to be very low. This calculation was carried out by the Centre for Decision Analysis and Risk Management at Middlesex University, who were commissioned by the NTSG.

Tree safety and the Law

7. Under both the civil law and criminal law, an owner of land on which a tree stands has responsibilities for the Health and Safety of those on or near the land and has potential liabilities arising from the falling of a tree or branch. The civil law gives rise to duties and potential liabilities to pay damages in the event of a

breach of those duties. The criminal law gives rise to the risk of prosecution in the event of an infringement of the relevant provisions.

The civil law

8. Common law: The owner of the land on which a tree stands, together with any party who has control over the tree's management, owes a duty of care at common law to all people who might be injured by the tree. The duty of care is to take reasonable care to avoid acts or omissions that cause a reasonably foreseeable risk of injury to persons or property. If a person is injured by a falling/fallen tree or branch, potential causes of action arise against the tree owner in negligence for a breach of the duty of care, and/or in nuisance (where the tree or branch falls on neighbouring land). The courts have endeavoured to provide a definition of what amounts to reasonable care in the context of tree safety, and have stated that the standard of care is that of the reasonable and prudent landowner. The tree owner is not, however, expected to guarantee that the tree is safe.
9. Occupiers Liability Act 1957: This imposes a statutory duty of care on an occupier of premises to take such care as in all the circumstances of the case is reasonable to see that the visitor will be reasonably safe in using the premises for the purposes for which he is invited or permitted by the occupier to be there. The duty of care under the Act is effectively the same as that at common law in respect of the torts of negligence or nuisance.
10. Occupiers Liability Act 1984: This provides for an occupier's liability to people other than visitors, in particular trespassers. However no duty will arise under this Act in respect of risk resulting from any natural feature of the landscape (which will include a tree) providing that the occupier does not intentionally or recklessly create the risk.
11. Highways Act 1980: Under section 154(2) of the Act a highway authority has the power to require trees growing on land adjacent to the highway that are dead, diseased, damaged or insecurely rooted to be removed by those responsible for the trees and, in default of removal, to take action itself to have the trees removed. This legislation is relevant to all three sites within the Division, as between them they have responsibility for 10 kilometres of roadside trees, Hampstead Heath being the main site with 8 kilometres. The roadside trees located around and across the Heath represent the largest number at 1,300 and these are inspected annually.
12. Some Regulations under the Health and Safety at Work etc Act 1974 may also give rise to liability under the civil law as well as under the criminal law.

The criminal law

13. Health and Safety at Work etc Act 1974: Sections 2 and 3 of the Act place a duty on employers to ensure, so far as is reasonably practicable, that in the course of conducting their undertaking, employees and members of the public are not put at risk. The acts of felling or lopping a tree clearly falls within the scope of this duty. It is also likely that the growing and management of trees on land falls within the scope of the duty where – as with the City's management of the Open Spaces – such operations fall within the employer's undertaking. The proviso "so far as is reasonably practicable" requires an employer to address the practical

and proportionate precautions which can be taken to reduce a risk. The courts have indicated that this requires a computation to be made by the employer in which the amount of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk, whether in terms of money, time or trouble, or the benefits of conducting the activity, are placed in the other.

14. Management of Health and Safety at Work Regulations 1999: Regulation 3 requires every employer to make a suitable and sufficient assessment of the risks to the Health and Safety of his employees whilst at work, and to other persons arising out of or in connection with the conduct by him of his undertaking. This necessarily requires an employer to undertake a risk assessment of the tree stock on the land which forms part of the undertaking, and to operate an inspection system which focuses available resources on tree stock in high-use, high-target areas. The HSE Section Minute referred to above suggests a zoning process as the most practicable method of complying with this legal duty.

Tree Risk management at Hampstead Heath, Highgate Wood, and Queen's Park.

15. The three sites that make up the North London Open Spaces Division have exercised a risk zoning process since 2006. This has proved very effective and allows the tree inspection process to be undertaken internally, using the skills and experience of arboricultural staff, all of whom have the LANTRA Professional Tree Inspection Qualification. This is recognised nationally as the required level for those carrying out tree inspections as a regular part of their work, and assessing trees in areas of high use.
16. In order to make the recording of the inspection process easier, we use a tree management database called Arbortrack, widely used by other organisations and landowners, including other City of London Open Spaces. Of the 25,000 trees across the Division, 7,280 are recorded on Arbortrack, which equates to just under 30% of the total estimated tree stock. The majority of these trees are within the high-risk zone containing roads, facilities and surrounding property.
17. In 2012 the zoning system was modified following advice from a Tree Risk Management Consultant, who also carries out annual tree management audits for the Division. This recommendation followed various discussions about the efficacy and precision of the system that was used at the time, and the lengthy process of inspecting every single tree and recording findings. The proposal was to carry out the annual inspection as a 'walk over' process using the Visual Tree Assessment (VTA) protocol, and only recording individual trees that required works. The high, medium, and low zoning system would be retained but the individual zones would themselves be categorised according to perceived risk. This can be mostly easily explained by taking the example of highways and traffic flows, where classification depends on whether the road is a busy arterial road with high numbers of vehicles or mainly used for access only. By 'sequencing' each risk category, it was possible to identify more effectively where the inspection operation could be focused.

| HAMPSTEAD HEATH & QUEENS PARK - RISK SEQUENCING AREAS | | | | | | Date of Inspection | Who | Duration (people hrs) | Number of trees | Tree works required | Post weather event walk over | |
|---|-----------|--|---|--|-------------|--------------------|----------|-----------------------|-----------------|---------------------|------------------------------|----------------------|
| Group | Sub Group | Target Type | Target Use | Area & description | Priority No | | | | | | | |
| High 1 | | | | | | | | | | | 12-Dec | 15-Jan |
| 1 | A1 | Major external road | Very high volume vehicular traffic | North End Way (both sides) - A road | 20 | 07/02/2014 | DH/NH | 3 hrs | 98 | 5 | Y | Y |
| 1 | A2 | Over ground train Line | Frequent rail passage | Gospel Train Line (including play facilities) | 20 | 11/02/2014 | CD/NH | 1.5 mins | 46 | 2 | Y | Y |
| 1 | A3 | Major external road | Very high volume vehicular traffic | Spaniards Road (both sides & Hampstead Lane orchard section) - B road | 20 | 06/03/2014 | CD/NH | 4.5 hrs | 224 | 4 | Y | Y |
| 1 | B1 | Major external road | High to moderate volume vehicular traffic | East Heath Road (incl Vale road, & White stone gate) - Classified unnumbered road | 19 | 10/04/2014 | DH/NH | | 213 | | Y | Y |
| 1 | B2 | Major external road | High to moderate volume vehicular traffic | Southend Green (inc Keats House, Willow road & Heathside) - Classified unnumbered road | 19 | 12/03/2014 | CD/NH | 2 hrs | 75 | 30 | Y | Y |
| 1 | B3 | Major external road | High to moderate volume vehicular traffic | Highgate Road - Classified unnumbered road | 19 | 15/04/2014 | NH | 30 mins | 27 | | Y | Y |
| 1 | C1 | Major external road | Moderate volume vehicular traffic | Queens Park (external road) - Classified unnumbered & B road | 18 | 23/06/2014 | CD/DH | 4hrs | 194 | 9 | Y | Y |
| 1 | C2 | Major external road | Moderate volume vehicular traffic | West Heath Road (including Branch Hill & Judges Walk) | 18 | 30/06/2014 | DH | 1.5hrs | 138 | 3 | Y | Y |
| 1 | C3 | Major external road | Moderate volume vehicular traffic | Hampstead Way/Widwood Road | 18 | 03/07/2014 | DH/CDPC | 4.5hrs | 225 | 4 | Y | Y |
| 1 | C4 | Major external road | Moderate volume vehicular traffic | West Heath Avenue - Classified unnumbered road links to A road | 18 | 20/06/2014 | DH/JM | 1hr | 15 | | Y | Y |
| 1 | D1 | Major external road | Moderate to low volume vehicular traffic | Millfield Lane - Classified unnumbered road links to B road | 17 | 04/07/2014 | CD | 1hr | 60 | | Y | Y |
| High 2 | | | | | | | | | | | | |
| 2 | A | Focus/formal areas | High public invited access area | Dams - Water safety management area | 16 | | MS | 4 hrs | 76 | | Y | Y |
| 2 | B1 | Focus/formal areas | High public invited access area | Queens Park - High local residency | 15 | 15/09/2014 | CD/MS | 5hrs | 374 | 13 | Y | Y |
| 2 | B2 | Focus/formal areas | High public invited access area | Golders Hill Park - Moderate - high local residency | 15 | 12/11/2014 | DH/CD/MS | 6hrs | 1499 | 13 | Y | Y |
| 2 | C | Focus/formal areas | High public invited access area | Play & education areas - inc PH, BH, Vale, GH, Ext & KW | 14 | 18/11/2014 | CD/MS | 6hrs | 105 | 9 | Y | Y |
| 2 | D | Focus/formal areas | High public invited access area | Swimming Ponds - Amenity usage | 13 | 08/11/2014 | CD/MS | 6hrs | | 3 | Y | Y |
| Medium | | | | | | | | | | | | |
| 3 | A1 | Paths/tracks | High to moderate pedestrian use | Parliament Hill below Kyte Hill - Surfaced footpath/pavement | 12 | 26/1/2015 | DH/CD/MS | 2.5hrs | ? | 9 | Y | Y |
| 3 | A2 | Property boundary | High to moderate pedestrian use | Various (see map) | 12 | 23/12/2014 | AN | 5hrs | ? | 3 | Y | Y |
| 3 | A3 | Paths/tracks | High to moderate pedestrian use | Cycle Tracks - Surfaced footpath/pavement | 12 | 06/02/2015 | CD/AN/MS | | ? | | Y | Y |
| 3 | B | Paths/tracks | Moderate to high pedestrian use | Hampstead Gate - Chubb path - South Meadow tarmac path | 11 | 14/01/2015 | MS/AN | 3hrs | | | Y | Y |
| 3 | C | Paths/tracks | Moderate to high pedestrian use | Hill Garden & outside the main entrance - Surfaced footpath/pavement | 10 | 15/12/2014 | DH/CD/AN | 3hrs | 57 | 1 | Y | Y |
| 3 | D | Paths/tracks | Moderate to high pedestrian use | Lime Avenue - Surfaced footpath/pavement | 9 | 22/12/2014 | AN | 1hr | | 1 | Y | Y |
| 3 | E | Paths/tracks | Moderate to high pedestrian use | West Heath Main paths - Surfaced footpath/pavement | 8 | | | | | | Y | Y |
| 3 | F | Paths/tracks | Moderate to high pedestrian use | Extension internal paths - Surfaced footpath/pavement | 7 | | | | | | Y | Y |
| 3 | G | Paths/tracks | Moderate to high pedestrian use | Pond Beat - Surfaced footpath/pavement | 6 | | | | | | Y | Y |
| 3 | H1 | Paths/tracks | Moderate pedestrian use | Athlone garden - Surfaced footpath/pavement | 5 | | | | | | Y | Y |
| 3 | H2 | Paths/tracks | Moderate pedestrian use | Sandy heath internal paths - Surfaced footpath/pavement | 5 | | | | | | Y | Y |
| Low 1 | | | | | | | | | | | | |
| 4 | A | Bridal Paths | Moderate to low horse & pedestrian use | Horse Rides Ext, Sandy, West Heath SouthMeadow - Bridal path (designatec | 4 | | | | | | | |
| 4 | B1 | Paths/tracks | Moderate to low pedestrian use | Vale foot paths - Broad trodden track, pedestrian use | 3 | | | | | | | |
| 4 | B2 | Paths/tracks | Moderate to low pedestrian use | Cohens Field - Broad trodden track, pedestrian use | 3 | | | | | | | |
| 4 | C | Desire paths | Moderate to low pedestrian use | Various Heath wide desire paths - Narrow single file trodden footpath | 2 | | | | | | | |
| Low 2 | | | | | | | | | | | | |
| 5 | A | Restricted/fenced off areas | Low pedestrian use | Bird sanctuaries & fenced ponds - Only authorised personnel enjoy access | 1 | | | | | | | |
| Key | | | | | | | | | | | | |
| Group 1 | | Major roads & rail line | | | High 1 | High Use targets | | Areas out of 31 | | | | |
| Group 2 | | Formal areas | | | High 2 | | | 22 | | | | |
| Group 3 | | Paths & well used tracks | | | Medium | Medium Use targets | | | | 3264 | | as of ... 26/01/2015 |
| Group 4 | | Bridal ways & significant desire lines | | | Low 1 | Low Use targets | | | | | | |
| Group 5 | | Fenced off area | | | Low 2 | | | | | | | |

Figure 1: Tree inspection schedule for 2014

18. The Risk Sequencing System (RSS) has been very successful, allowing the Team to inspect trees more effectively and achieve higher inspection numbers. The success of the system is highly dependent on the competence and training of the inspector. The trees that are being re-inspected are well known to the Inspection Team, and are each already recorded with their individual history on the Arbortrack database. Trees that require work are recorded and then allocated a priority on a separate works list, which is regularly updated by the Tree Management Officer. Tree inspection progress is reviewed at regular meetings between the Tree Manager and the Tree Management Officer. All tree incidents are recorded on a separate database that has been maintained since 2008.

Specialist tree inspection work

19. Members of the Tree Team have developed their skills and experience in carrying out detailed tree assessment over the past six years, and can now employ a variety of technical investigatory procedures that can determine structural integrity and the extent of decay in older or damaged trees. They can employ a micro drilling device called a Resistograph, which provides an instantaneous visual display of the internal structure of the branch or stem being assessed. This device allows the Team to determine the 'residual wall' strength of the tree and make decisions on whether the tree requires a crown reduction or other suitable management. The acceptable rule of 30% of the known radius of the tree's main stem is considered to be the optimum wall thickness, but there are exceptions to this guidance, depending on age and species.



Figure 2: Resistograph being used to test for internal decay

20. The Tree Team has also started to carry out more root inspection work when possible, often on trees where there are evident fruiting fungal bodies, or where the root zone is compacted. The Team uses a compressor-powered air lance or air spade to carry out the excavation work, which prevents damage to the larger, more significant lateral and supportive roots. This equipment has been used to great effect on a number of trees where root damage has been suspected and allowed construction design to be altered to avoid further damage. Air spading has proven very effective at reducing compaction around veteran trees on the busier, more frequented areas of Hampstead Heath. The image below is from a recent investigation in Highgate Wood on one of the larger oaks near Muswell Hill Road. The tree was previously damaged in the 1987 storm and it was discovered that the main stem has a significant crack that has now occluded over but can still be detected using the Resistograph.



Figure 3: Oak tree root investigation at Highgate Wood

Other technical skills including lifting and lowering operations.



Figure 4: Veteran oak crown reduction



Figure 5: Dismantling of a field boundary oak

21. Figures 4 and 5 above show lifting and lowering operations undertaken by the Tree Team over the past twelve months. Figure 4 involved a light crown reduction on a veteran oak at the bottom of the Tumulus Field, using the Highgate Wood hydraulic work platform. Figure 5 shows the Team working on an old field boundary oak in Golders Hill Park, which required dismantling using a 'spider' crane. The Team has started to use both types of equipment with greater frequency, developing their skills and expertise on technically challenging operations that would have previously required bringing in external contractors.
22. The significance of this changing approach to tree management is reflected more widely within the industry, with a greater emphasis on saving trees that would have previously simply been removed. Over the past ten to fifteen years, there has been an 'awakening' in the arboricultural world, with increased scientific understanding of the biomechanical properties of trees and their biology, and equally importantly how they interact with their surrounding environment. Arboriculturists can now employ an in-depth understanding of the 'body language' of trees, their complex relationship with the soil environment and other species, notably fungi. Equipped with this greater understanding of how trees grow and adapt to a suite of varying factors, the tree inspector can make more-informed decisions on how trees can be safely managed without major interventions.

Pest and Disease threats and the impact on tree safety

23. The Tree Team actively inspects populations of oak, London plane, ash and horse chestnuts for the presence of Oak Processionary Moth, *Massaria*, ash dieback, and horse chestnut bleeding canker. Records are kept of findings and then transferred to a series of maps that plot the extent of each respective disease. Trees that are sited in the high and medium zones are numerically prioritised and are subject to annual walk-over inspection by the Tree Team. *Massaria* of Plane remains a significant operational focus for the Tree Team, with established infection sites at South End Green and Queen's Park.



Figure 6: Branches with Massaria

24. Both the Divisional Tree Manager and the Tree Officer are involved with the London Tree Officers Association (LTOA) in the management of tree disease. The Tree Manager is a member of the LTOA's Biosecurity Working Party, which meets quarterly, and the Tree Officer has been significantly involved in the LTOA's guidance on managing Massaria. The importance of working with other organisations such as the Arboricultural Association and the Forestry Commission is critical in the ongoing control of tree disease.
25. The Tree Team works closely with partners in the Forestry Commission to track male Oak Processionary Moths (OPM), using pheromone traps across the site which feeds back into a London-wide mapping strategy. Last year 27 male moths were discovered in the traps across the Division. As yet, there have been no egg-carrying females discovered but there are known nests at the Zoo in Regent's Park, just over two kilometres to the south of the Heath. There have also been nests found at an Open Space in the Borough of Brent, which is within two kilometres of Queen's Park. This year there has been an additional winter survey carried out which has provided accurate information on the insect's current distribution in the London area. A number of further nests have been discovered in Regent's Park which is significant for the Heath. One of the potential concerns about the caterpillar when it is discovered on site is the impact this will have on the Tree Team's ability to work on the trees that have been colonised. The arrival of OPM will impact not only on public access and safety but also on existing tree management operations, and will need to be carefully considered.

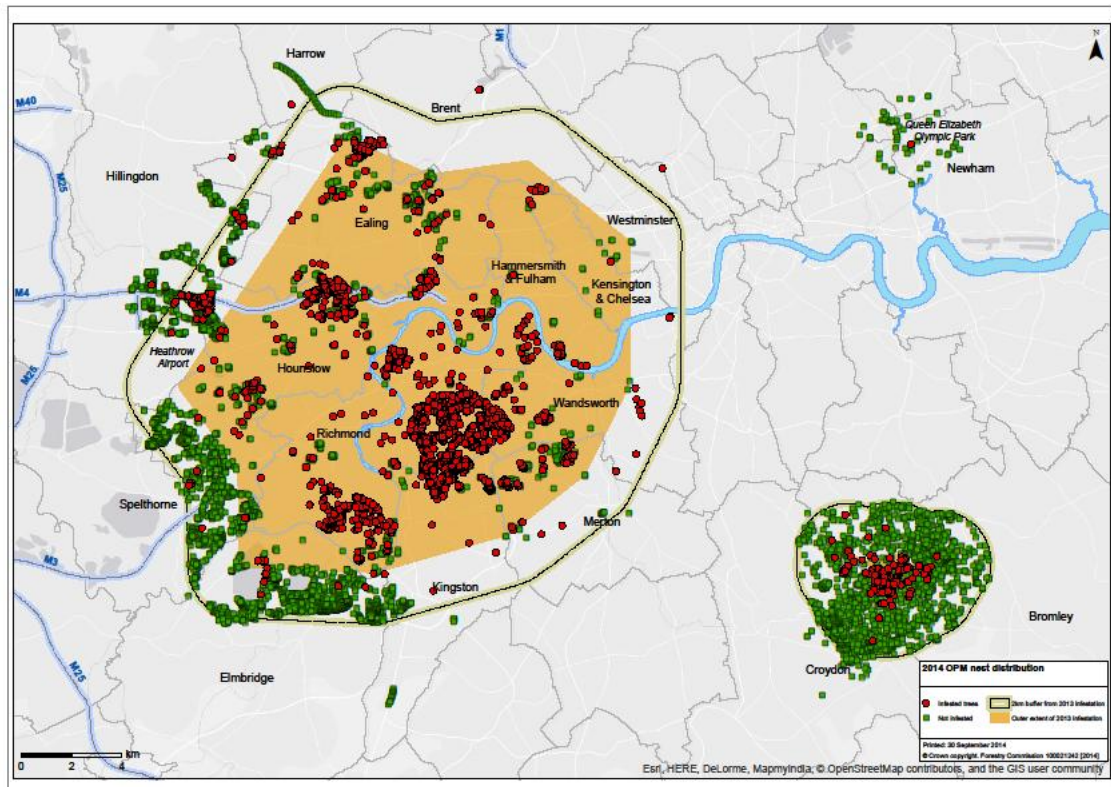


Figure 7: Oak Processionary Moth spread 2014

Increased frequency of extreme weather events

26. The St Jude’s Storm in October 2013 caused a huge increase in the tree incident records at both Hampstead Heath and Highgate Wood. The final total for 2013 was over 300 recorded incidents, a fourfold increase on the annual average. The impact of this was that the Tree Team’s operational work was severely disrupted and other teams had to provide support for the process of making the many damaged trees safe and clearing debris. A storm of this magnitude is commonplace in other parts of the world but in the UK it is relatively rare, though this trend is changing. This winter we have experienced a number of strong westerly weather systems, bringing high winds and heavy rain, but fortunately the predictions from the Meteorological Office proved to be incorrect and the damage this year has so far been very low.

27. In Highgate Wood, Golders Hill Park and Queen’s Park, an early warning system has been introduced, using the Meteorological Office’s messaging service. Storm warnings are generally issued three to four days beforehand, and this allows Management to issue instructions to staff to install signage warning of a possible site closure due to high winds. The system has been employed twice over the past three months but closures were not necessary, due to lower than predicted wind speeds.

Corporate & Strategic Implications

28. 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

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

30. The legal implications are contained within the body of this report.

Conclusion

31. The Tree Safety Management process at Hampstead Heath, Highgate Wood, and Queen's Park has developed in line with industry changes and a new, more scientifically based approach to managing trees. This new approach still has to operate within the parameters of the relevant legal requirements and Health and Safety considerations. The increasing frequency of severe weather events and the added requirement to manage the impact of tree disease is creating challenges for the Tree Management Team. Developing knowledge and technology, and the sharing of expertise and support from other organisations involved in the sector, will be critical in continuing to deliver a high-quality Tree Safety Management service.

Appendices

- Appendix 1 – 'Managing Tree Safety' City of London Open Spaces Department June 2014

Background Papers

- National Tree Safety Group guidance document 'Common Sense Risk Management of Trees'. Available to view or download from: <http://www.forestry.gov.uk/publications>.

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