

APPENDIX 7

Ecology study

Annex 7.1 - Details of bat roost potential of individual trees

A7. ECOLOGY STUDY

INTRODUCTION

- 7.1. Land Use Consultants was commissioned to undertake an ecological assessment of the tree resource of the Tower of London. The aim of this work was to report on the ecological value of the trees, advise on the need for further specialised ecological surveys and provide recommendations for the future management of the tree population. A summary of key issues is provided at the end of this appendix.
- 7.2. Trees support, and are supported by, a wide range of organisms. The ecological value of an individual tree will depend on numerous factors. Many organisms have highly species specific relationships with their host trees, others are more generalist and will exploit any tree that provides the required habitat. The species of a tree and its condition is therefore of high importance when judging its ecological value. The setting in which a tree grows also has a huge impact on its ecological value as this influences the organisms it interacts with and the way in which it will grow. Open grown trees are generally recognised as being the most valuable for wildlife as they reach their full potential for leaf area and flowering⁵⁴.
- 7.3. All mature trees identified by the arboricultural tree survey⁵⁵ and the October 2007 update (85 in total), were assessed by an LUC ecologist during a survey on the 14 November 2007. This survey was timed to occur after the majority of leaves had fallen from the trees, thus providing good visibility and allowing a clear appraisal of the trees form to be made. When assessing the trees, particular attention was paid to their potential to support protected species (i.e. bats and nesting birds).

LEGISLATION

Bats

- 7.4. Legal protection of bats has recently been amended. All British species of bat are listed on the **Wildlife and Countryside Act 1981** (as amended) Schedule 5, which transposes the **Bern Convention** into UK law⁵⁶. It is therefore an offence to deliberately kill, damage, take (Section 9(1)) a bat; to intentionally or recklessly disturb a bat whilst it occupies a place of shelter or protection (Section 9(4)(b)); or to deliberately or recklessly damage, destroy or obstruct access to a bat roost (Section 9(4)(c)). The possession and sale of bats are also controlled but are not relevant to the proposed scheme (Section 9(2) and 9(5) respectively). The 1981 Act places an obligation on the developer and owner of the site to consider the presence of bats, for example, damage to a roost caused by a lawful operation is not an accepted defence.

⁵⁴ K. Alexander, J. Butler & T. Green (October, 2006) The value of different species of tree and shrub species to wildlife. *British Wildlife* 18: 18-28

⁵⁵ The Thurman Consultancy (July, 2005) Arboricultural Assessment Report: Historic Royal Palaces, HM Tower of London.

⁵⁶ Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

- 7.5. A bat roost is defined as any structure or place, which is used for shelter or protection, irrespective of whether or not bats are resident. Buildings and trees may be used by bats for a number of different purposes throughout the year including resting, sleeping, breeding, raising young and hibernating. Use depends on bat age, gender, condition and species as well as the external factors of season and weather conditions. A roost used during one season is therefore protected throughout the year and any proposed works that may result in disturbance will require a Natural England licence.
- 7.6. All British bats are also listed on **Annex IV** of the **Habitats Directive 1992**⁵⁷, transposed into UK law by the **Conservation (Natural Habitats & c.) Regulations 1994** (as amended) under Schedule 2. Regulation 39 strengthens the protection of bats against deliberate capture or killing (Regulation 39(1)(a)), deliberate disturbance (Regulation 39(1)(b))⁵⁸ and damage or destruction of a resting place (Regulation 39(1)(d)).
- 7.7. All UK species of bat are also listed on the **UK and London Biodiversity Action Plans (BAP)**. Under the Countryside and Rights of Way Act 2000 the Government has a duty to ensure that parties take reasonable practicable steps to further the conservation of these listed species.

Birds

- 7.8. All wild birds in the UK, their nest and their eggs are protected by the Wildlife and Countryside Act (1981, and later amendments) and the CROW Act 2000. Under this legislation, it is an offence, with certain exceptions, to:
- intentionally or recklessly kill, injure or take any wild bird;
 - intentionally or recklessly take, damage or destroy the nest of any wild bird while it is in use or being built;
 - intentionally take or destroy the egg of any wild bird.

METHODOLOGY

- 7.9. All trees were inspected from the ground using close focusing binoculars. Where possible this was done from all sides, however the setting of many of the trees prevented access from one or more aspects. Information about the trees size was taken from the 2005 arboricultural survey.
- 7.10. Evidence of bat use and the presence of features that would provide potential habitat for roosting bats (for example lifting bark, splits, cracks and holes) was recorded. The bat roosting potential of each tree was classified as negligible, possible, obvious or confirmed. Definitions of each class are as follows:

⁵⁷ Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora

⁵⁸ Relates specifically to deliberate disturbance in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young or ii) the local distribution of that species.

Bat Roost Potential	Description
Negligible BRP	An inspected feature which is considered to have no potential importance for roosting bats.
Possible BRP	<p>From the ground, tree appears to have features (holes, cavities or cracks) that extend back into a cavity. However, owing to the aspect, the feature may support singleton bats outside of hibernation.</p> <p>Alternatively, if no features are visible but owing to its size and age and structure, the tree is considered likely to have hidden features that only an elevated inspection may reveal.</p> <p>In respect of ivy cover, this is not dense (i.e. providing BRP in itself) but may mask the presence of BRP features.</p> <p>Emergence and activity surveys may be required. If following all surveys the feature remains categorised as Possible BRP, works typically proceed under supervision by an experienced bat worker, as a precautionary measure. For example, including a re-inspection immediately prior to works and sectioned felling of a tree. The requirements of DEFRA licensing will be re-considered should bats or evidence of bat activity be identified during the supervision.</p>
Obvious BRP	<p>Features include holes, cracks, crevices or dense ivy cover (that itself provides cavities) that extend or appear to extend back to cavities suitable for bats. Ivy cover is sufficiently well-established and matted so as to create potential crevices between the growth and the trunk.</p> <p>Emergence and activity surveys may be required.</p> <p>A DEFRA licence is not required for works that affect unconfirmed roosts. However, if following all surveys the feature remains categorised as Possible BRP, works should proceed only under supervision by a licensed bat worker following pre-agreed procedures. The requirements of DEFRA licensing will be re-considered should bats or evidence of bat activity be identified during the watching brief.</p>
Confirmed roost	<p>Bats or evidence of bats recorded – both of recent and/or historic activity. Emergence surveys will be required to qualify and quantify usage if such a feature is to be affected by proposed works.</p> <p>A DEFRA licence is required for all works affecting features supporting confirmed roosts.</p>

RESULTS

- 7.11. The tree resource at the Tower of London is under an intensive management regime. As such, all trees inspected during this survey showed evidence of past works carried out. This management means that none of the trees were observed to have a significant volume of dead wood in the crown. The other by product of this intensive management regime is that very few of the trees had features like tears and scars, split limbs and live stubs. These features can provide specialist habitat niches for many species and their absence reduces the ecological value of the trees.
- 7.12. The setting of the Tower of London means all the trees are described as open grown, with the majority having very little competitive interactions with their

neighbours for light. The ground layer around the trees is as intensively managed as the trees themselves. The result of this is the complete absence of fallen deadwood around the trees. A number of the trees stand in amenity grassland which itself supports a very low diversity of plant species (limited to species common in lawns). A few of the trees are located in raised beds surrounded by ornamental shrubs. In the north of the site there is a small parkland area. Here many of the trees are located in sparse flower beds or banks of shrubbery.

- 7.13. Of the 85 trees inspected during this survey, 61 were London plane *Platanus x hispanica*. In their review of the ecological value of different species of tree, Alexander *et al* (2006) rated the London plane as one of the poorest in all categories. This work took into account the importance of the tree to invertebrates, fungi and other fauna. The other trees found at the Tower of London include oak *Quercus robur*, Wych elm *Ulmus glabra*, lime *Tilia* sp. ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus*. All these species were judged by the study as providing relatively high ecological value.
- 7.14. No confirmed bat roosts or signs of bat activity were observed during the survey. Due to the nature of the tree stock, with almost all the mature trees carry a large numbers of pruning wounds and the majority of these appeared to support small cavities that may host singleton bats outside of hibernation. Although to confirm this closer inspection (e.g. climbing) would be required. Four trees appeared to supported larger cavities that could support roosting colonies of bats. **Table 7.1** shows the bat roosting potential for each tree and the results are illustrated on Figure A7.1. Full details of the features recorded on each tree are given in Annex 7.1 of this appendix.

Table 7.1: Bat roost potential of the trees at the Tower of London

Arboricultural survey ref no. and tree species	DBH (cms)	Potential to support roosting bats.
100. London plane	120	Possible
103. Hybrid poplar	140	Negligible
104. London plane	80	Obvious
105. London plane	70	Negligible
106. London plane	60	Negligible
107. London plane	60	Possible
108. London plane	50	Possible
109. London plane	60	Negligible
110. London plane	105	Negligible
111. London plane	90	Possible

Arboricultural survey ref no. and tree species	DBH (cms)	Potential to support roosting bats.
I 12. London plane	110	Obvious
I 13. London plane	85	Possible
I 14. London plane	90	Negligible
I 15. London plane	170	Possible
I 16. London plane	160	Obvious
I 17. London plane	105	Possible
I 18. London plane	110	Negligible
I 19. London plane	95	Negligible
I 20. London plane	170	Possible
I 25. London plane	150	Possible
I 26. London plane	140	Negligible
I 27. London plane	130	Negligible
I 28. London plane	110	Negligible
I 29. London plane	110	Negligible
I 30. London plane	140	Possible
I 31. London plane	130	Possible
I 32. London plane	175	Possible
I 33. London plane	175	Possible
I 34. Sycamore	55	Negligible
I 35. Lime	55	Negligible
I 36. London plane	110	Possible
I 37. Lime	85	Negligible
I 38. London plane	110	Negligible
I 39. London plane	110	Negligible
I 40. London plane	110	Possible
I 41. London plane	120	Possible
I 42. London plane	130	Possible

Arboricultural survey ref no. and tree species	DBH (cms)	Potential to support roosting bats.
143. London plane	110	Possible
144. London plane	120	Possible
145. London plane	120	Obvious
146. Lime	60	Negligible
147. Lime	50	Negligible
148. London plane	80	Negligible
149. Sycamore	60	Negligible
150. Wych elm	60	Negligible
151. London plane	130	Possible
152. Wych elm	60	Possible
153. London plane	110	Possible
155. London plane	110	Possible
156. London plane	110	Possible
157. London plane	145	Possible
168. Tree of heaven	60	Negligible
170. Mulberry	50	Negligible
171. Weeping ash	50	Negligible
172. Ash	70	Negligible
173. Ash	80	Possible
1. Oak	Na	Negligible
2. Oak	Na	Negligible
3. Oak	Na	Negligible
4. Oak	Na	Negligible
5. Oak	Na	Negligible
6. Oak	Na	Negligible
7. Oak	Na	Negligible
8. London plane	Na	Negligible

Arboricultural survey ref no. and tree species	DBH (cms)	Potential to support roosting bats.
9. London plane	Na	Negligible
10. London plane	Na	Negligible
11. London plane	Na	Negligible
12. London plane	Na	Negligible
13. London plane	Na	Negligible
14. London plane	Na	Negligible
15. London plane	Na	Negligible
16. London plane	Na	Negligible
17. London plane	Na	Negligible
18. London plane	Na	Negligible
19. London plane	Na	Negligible
20. London plane	Na	Negligible
21. London plane	Na	Negligible
22. London plane	Na	Negligible
23. London plane	Na	Negligible
24. London plane	Na	Negligible
25. London plane	Na	Negligible
26. London plane	Na	Negligible
27. Plum	Na	Negligible
G28. Wild cherry	Na	Negligible
G29. Crab apple and Parrotia	Na	Negligible

7.15. The survey took place outside of the breeding bird season and as such no active nests or breeding bird activity was seen. The size of all the trees surveyed means that their canopies would provide nesting opportunities for some birds. In addition the features observed that provide roosting opportunities for bats would similarly provide nesting opportunities for birds. Therefore, all the trees included in this survey must be regarded as providing opportunities for nesting birds.

KEY ISSUES

7.16. The primary issues relating to ecology are:

- The ecological resource provided by the trees at the Tower of London is of relatively low value.
- The trees and their surrounding habitat are intensively managed to provide an aesthetic resource rather than an ecological one. By changing this management regime it would be possible to increase the ecological value of the site.
- From a legislative standpoint, the need for additional ecological survey will be directly linked to the proposed tree management works and it is likely that further bat surveys should be undertaken.

ANNEX 7.1 – DETAILS OF BAT ROOST POTENTIAL OF INDIVIDUAL TREES

Tree Ref./Tag no.	Species	DBH (cm)	Description of bat roost potential	BRP (Neg/Poss/Obv/Conf)
100	London Plane	120	No obvious cavities but tree too large to confirm their absence	Possible
103	Hybrid Poplar	140	No visible cavities	Negligible
104	London Plane	80	1 medium sized wound leading to cavity	Obvious
105	London Plane	70	No visible cavities	Negligible
106	London Plane	60	No visible cavities	Negligible
107	London Plane	60	1 Small hole leading to possible cavity	Possible
108	London Plane	50	2 Small hole leading to possible cavity	Possible
109	London Plane	60	No visible cavities	Negligible
110	London Plane	105	No visible cavities	Negligible
111	London Plane	90	Pruning wound leading to possible cavity	Possible
112	London Plane	110	2 medium sized holes (5-10cm) appear to lead to cavities	Obvious
113	London Plane	85	1 large wound which appears to lead to cavity. This cavity is pointing upwards and is therefore exposed to the elements reducing its value to bats	Possible
114	London Plane	90	No visible cavities	Negligible
115	London Plane	170	A large tear is present where a limb has fallen off. No visible cavities but the tree was too large to confirm their absence.	Possible
116	London Plane	160	2 holes observed which appeared to lead to cavities. 1 small (>5cm) and 1 medium (5-10cm) sized hole.	Obvious
117	London Plane	105	1 Small hole leading to possible cavity	Possible
118	London Plane	110	No visible cavities	Negligible
119	London Plane	95	No visible cavities	Negligible
120	London Plane	170	Numerous wounds including 2 large tears were observed on this tree. 2 small holes leading to possible cavities were observed.	Possible
125	London Plane	150	1 small hole appears to lead to cavity	Possible
126	London Plane	140	No visible cavities	Negligible
127	London Plane	130	No visible cavities, there are numerous splits in the bark but they do not appear to lead to any cavities	Negligible

Tree Ref./Tag no.	Species	DBH (cm)	Description of bat roost potential	BRP (Neg/Poss/Obv/Conf)
128	London Plane	110	No visible cavities	Negligible
129	London Plane	110	No visible cavities	Negligible
130	London Plane	140	1 small hole appears to lead to cavity	Possible
131	London Plane	130	1 small hole appears to lead to cavity	Possible
132	London Plane	175	several small pruning wounds appear to lead to cavities	Possible
133	London Plane	175	several small pruning wounds appear to lead to cavities	Possible
134	Sycamore	55	No visible cavities	Negligible
135	Lime	55	No visible cavities	Negligible
136	London Plane	110	No visible cavities, but large tree with relatively dense leaf cover so impossible to confirm absence.	Possible
137	Lime	85	No visible cavities	Negligible
138	London Plane	110	No visible cavities	Negligible
139	London Plane	110	No visible cavities	Negligible
140	London Plane	110	1 small hole possibly leading to a cavity	Possible
141	London Plane	120	No obvious cavities but tree too large to confirm their absence	Possible
142	London Plane	130	No obvious cavities but tree too large to confirm their absence	Possible
143	London Plane	110	No obvious cavities but tree too large to confirm their absence	Possible
144	London Plane	120	No obvious cavities but tree too large to confirm their absence	Possible
145	London Plane	120	1 small hole leading to possible cavity & 1 large cavity pointing upwards.	Obvious
146	Lime	60	No visible cavities	Negligible
147	Lime	50	No visible cavities	Negligible
148	London Plane	80	No visible cavities	Negligible
149	Sycamore	60	No visible cavities	Negligible
150	Elm	60	No visible cavities	Negligible
151	London Plane	130	No visible cavities, but large tree with relatively dense leaf cover so impossible to confirm absence.	Possible
152	Elm	60	1 large wound / tear which does not appear to lead to a cavity	Possible

Tree Ref./Tag no.	Species	DBH (cm)	Description of bat roost potential	BRP (Neg/Poss/Obv/Conf)
153	London Plane	110	No obvious cavities but tree too large to confirm their absence	Possible
155	London Plane	110	No visible cavities, but large tree with relatively dense leaf cover so impossible to confirm absence.	Possible
156	London Plane	110	No visible cavities, but large tree with relatively dense leaf cover so impossible to confirm absence.	Possible
157	London Plane	145	No visible cavities, but large tree with relatively dense leaf cover so impossible to confirm absence.	Possible
168	Tree of Heaven	60	No visible cavities	Negligible
170	Mulberry	50	No visible cavities	Negligible
171	Weeping ash	50	1 large wound / tear and a medium sized pruning wound were observed on the trunk but neither of these appeared to lead to a cavity	Negligible
172	Ash	70	No visible cavities	Negligible
173	Ash	80	Ivy clad to 8m. Not old enough to provide a bat roosting feature in itself but may obscure cavities.	Possible
1	Oak	Na	No visible cavities	Negligible
2	Oak	Na	No visible cavities	Negligible
3	Oak	Na	No visible cavities	Negligible
4	Oak	Na	No visible cavities	Negligible
5	Oak	Na	No visible cavities	Negligible
6	Oak	Na	No visible cavities	Negligible
7	Oak	Na	No visible cavities	Negligible
8	London Plane	Na	No visible cavities	Negligible
9	London Plane	Na	No visible cavities	Negligible
10	London Plane	Na	No visible cavities	Negligible
11	London Plane	Na	No visible cavities	Negligible
12	London Plane	Na	No visible cavities	Negligible
13	London Plane	Na	No visible cavities	Negligible
14	London Plane	Na	No visible cavities	Negligible
15	London Plane	Na	No visible cavities	Negligible
16	London Plane	Na	No visible cavities	Negligible
17	London Plane	Na	No visible cavities	Negligible
18	London Plane	Na	No visible cavities	Negligible

Tree Ref./Tag no.	Species	DBH (cm)	Description of bat roost potential	BRP (Neg/Poss/Obv/Conf)
19	London Plane	Na	No visible cavities	Negligible
20	London Plane	Na	No visible cavities	Negligible
21	London Plane	Na	No visible cavities	Negligible
22	London Plane	Na	No visible cavities	Negligible
23	London Plane	Na	No visible cavities	Negligible
24	London Plane	Na	No visible cavities	Negligible
25	London Plane	Na	No visible cavities	Negligible
26	London Plane	Na	No visible cavities	Negligible
27	Plum	Na	No visible cavities	Negligible
G28	3 Wild cherry	Na	No visible cavities	Negligible
G29	3 Parrotia 2 Crab Apple	Na	No visible cavities	Negligible