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PO Box 64529  
London  
SE1P 5LX

19 November 2015

Dear stakeholders,

**Re: London Wildlife Trust bat survey reports Site Z and Site D1, September 2015**

Please find enclosed London Wildlife Trust's (LWT) bat survey reports (September 2015).

In line with the recommendations identified in LWT's report we commissioned a licensed bat specialist to undertake roost surveys of the trees identified for felling in Area Z and D1.

This survey took place on 17 November 2015 and involved climbing the trees and inspecting with an endoscope and high powered lighting to identify if bats were roosting in the trees. All features that could be used by bats for roosting were inspected.

No bats roosts were found in the survey and all features were closed to stop them being used as a roost in future. For your information, if a roost had been discovered then a licence would have been applied for to Natural England to relocate the bats.

Next week we will also be installing 16 bat boxes on trees in the vicinity of the works to mitigate against the loss of the niche habitat.

Please note we will not be felling any trees at this stage. This work is precautionary to ensure we adhere to the London Wildlife Trust's recommendations. Please also note that, when it come to felling the trees, we will be employing a licensed bat specialist on a watching brief to check for bat roosts prior to felling.

Yours sincerely,

A handwritten signature in black ink that reads "RTowers".

Rebecca Towers  
Head of Parks and Leisure  
London Borough of Southwark  
Environment & Leisure-Public Realm Division

Camberwell New Cemetery (Area D1),  
Brenchley Gardens, London Borough of  
Southwark SE23 3RD

Bat Survey Report

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Report for: London Wildlife Ltd

Prepared by: Huma Pearce BSc MSc MCIEEM

(Class 2 licence; Registration No. 2015-10493-CLS-CLS)

Date: September 2015

Reference No: 2015\_010



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## EXECUTIVE SUMMARY

Planning permission (15/AP/3190) is being sought for landscaping works within Area D1, Camberwell New Cemetery, Brenchley Gardens in the London Borough of Southwark SE23 3RD. Southwark Council commissioned bat surveys to evaluate the value of Area D1 to bats and the likely impacts of the proposals on these European Protected Species.

The key findings of the survey were:

- Area D1 forms part of the Borough Grade II Site of Importance for Nature Conservation known as Camberwell New Cemetery, Honor Oak Park Crematorium and Honor Oak Park Sports Ground. The site comprises a mosaic of secondary woodland, scrub, tall herbs and species poor semi-improved grassland with scattered mature trees and shrubs.
- 26 summer roosts and flight records for common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P.pygmaeus*, Nathusius' pipistrelle *P.nathusii*, noctule *Nyctalus noctula*, Leisler's bat *N. Leisleri*, serotine *Eptesicus serotinus*, brown long-eared bat *Plecotus auritus*, Daubenton's bat *Myotis daubentonii*, and Natterer's bat *M. nattereri* have been recorded within a 2km radius of the site.
- Ivy clad mature oaks and sycamores within the secondary woodland have MEDIUM/HIGH roost potential within the context of the survey area. Several *Populus sp*, located immediately west of Area D1, supported significant cavities of HIGH potential roost value.
- Area D1 offers suitable bat foraging and commuting habitat. The habitat is structural diverse and includes species that typically support a high insect biomass and the secondary woodland forms part of a larger woodland complex within Honor Oak Park and is well connected to other open spaces and woodland within the surrounding area.
- Common pipistrelle, soprano pipistrelle, Leisler's bat and noctule were recorded at the site. Pipistrelle bats were recorded during the emergence period.
- The likelihood of a transient roost, used by single or low numbers of soprano pipistrelle bats, occurring within the woodland in the south of the Area D1 was assessed as HIGH. A common pipistrelle roost used by single or low numbers of bats may also occur within the northern part of Area D1.
- Pipistrelle feeding activity was concentrated along the woodland edge, at the interface between woodland, scrub, tall herbs and grassland with scattered trees and shrub and the canopy of the woodland.
- Area D1 falls within a flight line used by commuting common pipistrelle and soprano pipistrelle bats and low numbers of noctule and Leisler's bats.

There is a MEDIUM risk that the proposals will impact on a transient roosts used by low numbers of soprano pipistrelle bats. The loss of these roost sites would have a LOW impact on the local bat population. Tree works must follow and appropriate mitigation strategy to ensure compliance with the wildlife legislation, to include:

- Tree and vegetation clearance works should ideally be undertaken between mid September and the end of October which is outside of the bat hibernation period and bird nesting season.
- Any trees identified as having HIGH or MEDIUM roost potential should be climbed or accessed using a MEWP and all suitable roost features inspected by a Class 2 bat ecologist using an endoscope immediately prior to their removal. A search for nesting birds must also be carried out.
- Works can only proceed if no evidence of a bat roost or active nest is discovered. If a roost is discovered, works can only be legally carried out under licence from Natural England. If nesting birds are discovered, works within a 5m radius of the nest must be postponed until the young have fledged.

Bat boxes (No.8) and bird nest boxes (No.10) will be installed within the woodland, which will compensate for any loss of roost/nest sites arising from vegetation clearance activities. An additional 2 bat boxes should be provided and any bat boxes installed should be paired with bird boxes to reduce the likelihood of competition of bat boxes by nesting birds. Bat and bird boxes would need to be checked annually by a suitably qualified ecologist to ensure the long-term value of these features. The trees would also need to be appropriately managed in order to ensure that clear entry paths to the boxes are maintained.

Given the small extent of the woodland habitat that will be removed, the impact of vegetation clearance works on foraging bats is assessed as LOW. Proposals to plant new native mixed woodland species at the edge of the existing woodland, the laying of wildflower turf/flowering lawn mixtures and seeding of disturbed grassland areas to create a wildflower meadow will enhance the biodiversity value of Area D1 in the long-term and compensate for the loss of the existing bat foraging resource. The overall impact of the proposals on foraging bats is therefore assessed as NEGLIGIBLE.

The impact of the landscaping proposals on commuting bats is assessed as NEGLIGIBLE.

## **1. INTRODUCTION**

### **1.1 BACKGROUND**

- 1.1.1 Planning permission (15/AP/3190) is being sought for localised ground modelling, drainage works, the laying out of new paths and associated landscape works within Area D1 at Camberwell New Cemetery in the London Borough of Southwark SE23 3RD. Some areas of secondary woodland habitat would need to be removed to enable these works.
- 1.1.2 Southwark Council commissioned bat surveys to assess the value of the site for bats and the potential impacts of the proposals on these European Protected Species (refer to Appendix A1 for wildlife legislation). This reports details the findings of the surveys completed in May and September 2015. It provides an assessment of the impact of the proposals on bats. Mitigation measures required to comply with the wildlife legislation are also described.

### **1.2 DESCRIPTION OF SITE**

- 1.2.1 Camberwell New Cemetery is situated on the south side of Brenchley Gardens in the London Borough of Southwark, SE23 3RD. The National Grid Reference for the centre of the cemetery is TQ357745. The perimeter of the site is fenced or walled. Vehicle and pedestrian access to the cemetery is via entrance gates on Brenchley Gardens (north-west), Brockley Way (north-east) and the footpath adjacent to Honor Oak Park Sports Ground (south) (see Appendix A2, Plan 1).
- 1.2.2 The cemetery dates back to the early 20<sup>th</sup> Century and is approximately 14.5 hectares (ha) in size. The cemetery forms part of the Borough Grade II Site of Importance for Nature Conservation (SINC) known as Camberwell New Cemetery, Honor Oak Crematorium and Sports Ground. The habitats and species for which the site was designated include secondary woodland, mature trees, hedges and common lizard. In addition to providing burial plots, the site is a recreational open space with public access permitted between 08:30 -19:00 during the summer months (April-September) and 08:30 – 04:00 during the winter (October to March).
- 1.2.3 Honor Oak Park Allotments are situated along the southern boundary of the cemetery and One Tree Hill Local Nature Reserve (LNR) occurs to the south-west. Brenchley Gardens, Borough Grade II SINC, lies immediately west of the cemetery, together with residential properties and private gardens. Brockley Way borders the site to the north and Honor Oak Crematorium and Honor Oak Park Sports Ground are situated along the eastern boundary.
- 1.2.4 The dominant habitat occurring at the cemetery is frequently mown semi-improved grassland with existing private graves and scattered mature trees and shrubs. Secondary woodland is mostly confined to the south-western corner of the site and this joins with One Tree Hill LNR and Brenchley Gardens Borough

Grade II SINC to form a larger expanse of woodland. Dense mature tree lines at the western and northern boundary provided connectivity within the site and to other areas of open space in the surrounding area (see Appendix A2, Plan 1).

1.2.5 Camberwell New Cemetery is situated in an urbanised area of south-east London and the surrounding land use supports residential properties and small scale commercial premises. Open spaces are dispersed within the landscape and include secondary and ancient woodland, meadows, acid, neutral and amenity grassland, ornamental planting, scrub, scattered mature trees, veteran trees and open water habitats.

1.2.6 No national statutory conservation designations apply to the site but Camberwell New Cemetery forms part of the Borough Grade II Site of Importance for Nature Conservation (SINC) known as Camberwell New Cemetery, Honor Oak Crematorium and Sports Ground.

1.2.7 Other statutory and non-statutory sites that occur within 2km's of the Cemetery are listed in Table 1. These include:

- Three Local Nature Reserves (LNR) of which the nearest is One Tree Hill LNR, located immediately west;
- Three Sites of Metropolitan Importance (SMI), the nearest is Forest Hill to New Cross Gate Railway Cutting which is 110m south;
- Six Borough Grade I SINC's, of which the nearest is One Tree Hill LNR, immediately west; and,
- Five Borough Grade II Sites of Importance for Nature Conservation, of which one is the site itself.

1.2.8 Metropolitan sites are of regional importance (to the whole of Greater London) and Borough Grade I and II sites are important in a borough-wide context.

### **1.3 THE APPLICATION SITE – AREA D1**

1.3.1 Area D1 comprises c.0.9ha of land at the south-west corner of Camberwell New Cemetery (see Appendix A2, Plans 1 and 2). The site is situated immediately adjacent to Honor Oak Park Allotments (south) and One Tree Hill LNR (west); separated only by a metal post boundary fence. The remainder of Camberwell New Cemetery lies to the north and east. The National Grid Reference for the centre of Area D1 is TQ356 743.

1.3.2 The habitats occurring within Area D1 include secondary woodland, scrub, tall herbs, frequently managed semi-improved grassland with existing private graves and mature scattered trees and shrubs. An informal woodland path occurs parallel to the western and northern boundary and there are two tarmac paths in the eastern part of the site which provide pedestrian access to the existing private graves.

1.3.3 Re-modeling, drainage, vegetation clearance and landscaping works are planned in the southern part of Area D1 (see Appendix A2, Plan 3).



**Table 1: Areas of open space within 2km of the site**

Site	Reason for designation	Distance and orientation
<b>Local Nature Reserves</b>		
One Tree Hill	Secondary woodland, Acid grassland, Common lizard, Stag beetle, Owls.	Adjacent, W
Sydenham Hill Wood and Fern Bank	Ancient woodland, Ponds, Veteran trees, Dead wood, Owls, Hobby, Kestrel, Sparrow hawk, Bats.	2km SW
Nunhead Cemetery	Secondary woodland, Grassland, Tawny owl, Greater spotted woodpecker.	910m N
<b>Sites of Metropolitan Importance</b>		
Nunhead Cemetery	As above	
Dulwich and Sydenham Hill Wood	As above	
Forest Hill to New Cross Gate Railway Cutting	Woodland, Acid & Neutral grassland, Reed bed, Scrub.	360m, SE
<b>Sites of Borough Grade I Importance</b>		
One Tree Hill	As above	
Dulwich and Sydenham Hill Golf Course	Woodland, Pond, Oak pollards, Scrub, Acid grassland.	1.6km SW
Peckham Rye Park and Common	Standing & running water, Veteran trees, Woodland, Parkland, Wildflower meadows, Stag beetle, Watercress, Water figwort, Lamprey, Kingfisher, Bats, House sparrow.	775m NW
Dulwich Park	Standing water, Parkland, Waterfowl, Bats, Veteran trees, Stag beetle, Woodland birds.	1.8km, SW
Centre for Wildlife Gardening	Ponds, Wildflower plots, Meadow, Common frog, Smooth newt, Stag beetle.	2km, NW
Camberwell Old Cemetery	Burial Ground, Grassland, Mature trees, Secondary woodland, Scrub, Black poplar	622m, W
<b>Sites of Borough Grade II Importance for Nature Conservation</b>		
Camberwell New Cemetery, Honour Oak Crematorium, Sports ground.	Secondary woodland, Hedges, Mature trees, Common lizard.	0m
Brenchley Gardens	Woodland, Grassland, Pollarded ash, Cowslip, Stag beetle.	Adjacent, N
Aquaria Golf Course	Neutral grassland, Grey sedge.	190m, N
Dawson's Hill	Woodland, Neutral grassland, Hedgehog, Bats, Fruiting hedges.	1.15km WSW
Nunhead Railway Embankment	Woodland, Grassland, Sycamore, Ash, Wild cherry.	1.65km, N
<b>Registered Park and Garden Grade II</b>		
Horniman Gardens		780m, S

## 1.4 PROPOSALS FOR AREA D1

1.4.1 Planning permission (15/AP/3190) is for localised ground modelling, drainage works, the laying of new pedestrian paths and associated landscaping. Some woodland habitat would need to be cleared to enable these works. Plan 4 in Appendix A2 shows the trees and scrub vegetation that would be removed. This includes 10 x semi-mature oak, 8 x semi-mature sycamore, 3 x *Prunus sp.*, 1 x *Betula sp.*, 1 x mature hawthorn and 1 x Lombardy poplar.

1.4.2 Following the removal of vegetation and completion of the regrading and drainage works, the application site would be landscaped to include:

- The creation of new tarmac paths that would provide pedestrian access to the new burial area;
- The planting of native trees and shrubs to create new areas of secondary mixed woodland/woodland edge;
- The laying of species rich wildflower turf;
- The seeding of disturbed areas with a species rich wildflower mix and management as a meadow; and,
- The creation/installation of habitat refuges; bat boxes (No.8), bird nest boxes (No.10), log piles (No.3) and hibernaculum (No.1); within the retained woodland.

1.4.3 Full details of the landscaping proposals are shown in Appendix A2, Plan 5.

## 1.5 THE ECOLOGICAL SURVEY

1.5.1 The ecological assessment comprised: a desktop study, daytime habitat assessment, a ground level inspection of trees identified for removal, two evening bat emergence and activity surveys and longer-term monitoring of bat activity at notable habitat features using static detectors.

1.5.2 The surveys were completed by a Class 2 Natural England Bat Licensee (Registration No. 2015-10493-CLS-CLS) and followed the methodology outlined in the Bat Conservation Trust (2012) Bat Surveys – Good Practice Guidelines.

## 1.6 LIMITATIONS

1.6.1 The arboricultural report was not available for the Preliminary Bat Assessment and it was difficult to accurately determine which trees were planned for removal from the plans provided. This information was only made available following the completion of the bat surveys. The assessment of specific trees proposed for removal was based on general habitat data collected during the Preliminary Bat Assessment, information provided in the arboricultural survey report and observations made during the evening bat

emergence and activity surveys.

- 1.6.2 The Preliminary Bat Assessment was commissioned in May 2015, a time of year when tree and shrub vegetation was in full leaf which made it difficult to accurately identify cavity features.
- 1.6.3 There were periods of heavy rain during the static detector surveys, which will affect bat activity such as later emergence times and reduced activity.

## **2. METHODOLOGY**

### **2.1 DESK STUDY**

- 2.1.1 A data search of all known bat records within a 2km search radius of Area D1 was obtained from the London Bat Group in April 2015. The purpose of the study was to determine whether there was any historical evidence of a roost within or near to the site and to ascertain the species of bat known to be present within the immediate surrounding area.

### **2.2 PRELIMINARY BAT ASSESSMENT**

- 2.2.1 A daytime habitat assessment of Area D1 was carried out on the 18<sup>th</sup> and 28<sup>th</sup> May 2015 to evaluate the potential value of the habitats for roosting, foraging and commuting bats.
- 2.2.2 All mature trees within the application site were inspected for the presence of potential roost features such as natural holes, cracks/splits in major limbs, loose bark, the presence of dense epicormic growth and/or ivy. Bat field signs, notably droppings, scratch marks and urine and fur oil staining around suitable crevices were also search for. The survey was carried out using close focusing binoculars and a high power torch and the assessment was based on methodology outlined in the Bat Conservation Trust Bat Survey Guidelines (2012) and Andrew Cowan, ArborEcology, 2003.
- 2.2.3 An assessment of the value of the habitats in Area D1 to foraging and commuting bats was completed. Suitable foraging habitat includes edge and mosaic habitats, sheltered habitat features, broadleaved trees and aquatic habitats. Linear landscape features typically provide connectivity and flight lines for bats to navigate to suitable feeding sites. Aerial photographs of the site and surrounding area (Google Earth) were also reviewed as part of this assessment.
- 2.2.4 Notable habitat features were described as Target Notes (TN) and photographs are provided in Appendix A3 to support the descriptive text. Plan 6 in Appendix A3 shows the location of Target Notes.

### **2.3 BAT EMERGENCE AND ACTIVITY SURVEYS**

- 2.3.1 Two bat emergence and activity surveys were carried out at Area D1 on 28<sup>th</sup> May 2015 and 8<sup>th</sup> September 2015 by two surveyors. The surveys commenced at 15 minutes before sunset and lasted for two hours. Surveyors were equipped with Bat Box Duet Heterodyne and Frequency Division bat detectors and hand held recording devices. One unmanned detector with in-built recording capabilities (EM3+ or Anabat SD1) was also deployed within the survey area to monitor bat activity associated with notable habitat features. The location of surveyors and unmanned detectors is shown in Appendix A4, Plans 7 and 8.
- 2.3.2 All recorded bat calls were analysed using Bat Sound (Petterssen Elektronik; Bat Sound 4.1) and Analoow (Titley Electronics; Version 4.1) software to verify the species and bat activity observed during the surveys was mapped.
- 2.3.3 The May 2015 survey sought to provide baseline information on the value of the habitats within Area D1 to roosting, foraging and commuting bats. The September 2015 survey honed in on areas of the application site where roost sites were suspected from the data collected in May 2015.

#### ***May 2015***

- 2.3.4 Surveyor 1 was located in the northern part of Area D1 and was responsible for monitoring bat emergence from the poplar trees (with HIGH roost potential) located north-west of the application site as well as bat foraging and commuting activity within the northern part of Area D1. Surveyor 2 walked a transect around Area D1 and monitored bat activity along the informal woodland path and woodland edge. An unmanned detector (Anabat SD1; Titley Electronics) was deployed adjacent to the mature poplar (T515) and oak (T514) to monitor bat emergence from these trees as well as bat feeding and commuting activity along the woodland edge.

#### ***September 2015***

- 2.3.5 Surveyor 1 was located along the informal woodland path, where early bat records were noted during the May survey, to obtain further information about the likely location of roost sites. Surveyor 2 was located in the grassland clearing in the south of Area D1, to monitor the direction from which bats arrived to feed along the woodland edge and the likely presence of roost sites within trees located along the woodland edge. An unmanned detector (EM3+, Wildlife Acoustics Inc.) was deployed within the woodland where natural tree fall had created an opening in the canopy and where bats had been seen feeding early in the emergence period during the May 2015 survey.

### **2.4 STATIC DETECTOR SURVEYS**

- 2.4.1 Automated static detectors (SongMeter2; Acoustic Monitoring and Anabat SD1; Titley Electronics) were deployed at the site between the 18<sup>th</sup> and 27<sup>th</sup> May 2015 (No.2) and the 8<sup>th</sup> and 15<sup>th</sup> September 2015 (No.3) to monitor bat activity within the woodland, particularly in the vicinity of trees identified as having

MEDIUM and HIGH roost potential from the site assessment. The locations of detectors are shown on Plan 9 in Appendix A5.

- 2.4.2 The detectors were programmed to be active between sunset–30 minutes and sunrise+30 minutes. All bat calls picked up by the microphone were recorded and later analysed using Bat Sound (Petterssen Elektronik; Bat Sound 4.1) and AnalookW (Titley Electronics; Version 4.1) software to verify the species.

#### **May 2015**

- 2.4.3 Two static detectors were deployed within Area D1 between 18<sup>th</sup> and 28<sup>th</sup> May 2015 (10 nights). One detector (D1) was deployed in the north-western part of Area D1 where several poplars located adjacent to the site were found to support features of HIGH potential value to bats as a roost site. A second detector was stationed within the interior of the woodland in the southern part of Area D1 where there were several trees with MEDIUM/HIGH roost potential i.e. dead trees and trees clad with dense ivy.

#### **September 2015**

- 2.4.4 Three static detectors were deployed within the woodland in the southern part of Area D1 between 8<sup>th</sup> and 15<sup>th</sup> September 2015 (7 nights). Two detectors (D3 and D4) was deployed in the vicinity of several dead trees and trees clad with dense ivy which have MEDIUM/HIGH roost potential and where soprano pipistrelle bats were noted before and soon after sunset during the May survey. A third detector (D5) was located further west, within a natural clearing created by natural tree fall where bats had been observed feeding at canopy height.

## **3. RESULTS**

### **3.1 DESK STUDY**

- 3.1.1 A summary of the results of the London Bat Group data search is provided in Table 2 below.
- 3.1.2 Twenty-six summer roosts were returned from the data search. Twenty-three records were from Sydenham Hill Woods which is 2km south-west of the site. The nearest roost site was for *Pipistrellus* species at 1.45km, south west of the cemetery. One bat casualty record, which are often indicative of a roost occurring nearby, was also noted at 1.25km south of the site.
- 3.1.3 Flight records for common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle *P.nathusii*, unidentified *Pipistrellus* species, noctule, Leisler's bat, unidentified *Nyctalus sp.*, serotine *Eptesicus serotinus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *M. nattererii*, unidentified *Myotis sp.*, brown long-eared bat and unidentified vesper bats were also noted. The nearest flight record was for an unidentified bat, 173m south-west of the application site.

**Table 2: Summary of data returned from the London Bat Group data search**

Common name	Scientific name	Number of records	Direction and orientation of closest record
<b>Roost records</b>			
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	1	2km, SW
Soprano pipistrelle	<i>P.pygmaeus</i>	7	2km SW
Unidentified pipistrelle	<i>Pipistrellus sp</i>	6	1.45km, SW
Leisler's bat	<i>Nyctalus leislerii</i>	6	2km, SW
Noctule	<i>N.noctula</i>	1	2km, SW
Brown long-eared bat	<i>Plecotus auritus</i>	2	2km, NW
Vesper bat	<i>Vespertilionidae</i>	3	1.45km, SW
<b>Casualty records</b>			
Vesper bat	<i>Vespertilionidae</i>	1	1.25km, S
<b>Field records</b>			
Common pipistrelle	<i>P.pipistrellus</i>	75	473m, NW
Soprano pipistrelle	<i>P.pygmaeus</i>	39	437m, NW
Nathusius pipistrelle	<i>P.nathusii</i>	2	473m, NW
unidentified pipistrelle	<i>Pipistrellus sp</i>	16	473m, NW
Noctule	<i>Nyctalus noctula</i>	17	756m, S
Leisler's bat	<i>N. leislerii</i>	9	473m, NW
Unidentified Nyctalus sp	<i>Nyctalus sp.</i>	11	473m, NW
Serotine	<i>Eptesicus serotinus</i>	2	1.5km, SW
Natterer's bat	<i>Myotis nattererii</i>	2	2km, SW
Daubenton's bat	<i>M. daubentonii</i>	2	2.2km, SW
Unidentified Myotis bat	<i>Myotis sp.</i>	1	2km, SW
Brown long-eared bat	<i>Plecotus auritus</i>	1	2km, SW
Unidentified vesper bat	<i>Vespertilionidae</i>	11	173m, SW

### 3.1 PRELIMINARY BAT ASSESSMENT

- 3.1.1 The weather conditions during the site assessment were 18°C and dry with sunny intervals.
- 3.1.2 The habitats occurring within the survey area are described below and features of potential value to bats as a roost site, foraging habitat and flight line are reported. Photographs to support the descriptive text are presented in Appendix A3, together with a plan showing the location of target notes.
- 3.1.3 Area D1 comprised secondary woodland, scrub, tall herbs, semi-improved grassland, and scattered mature trees and scrub. Photographs 1 (TN1) and 2 (TN2) show the area to be impacted by the works.

#### **Secondary woodland**

- 3.1.4 Although small in extent (c. 0.4ha), the woodland in Area D1 forms part of a larger woodland complex within Honor Oak Park.
- 3.1.5 The woodland was dominated by oak *Quercus sp.* and sycamore *Acer pseudoplatanus* with frequent ash *Fraxinus excelsior* and wild cherry *Prunus avium*. The understorey supports an abundance of ivy *Hedera helix* and brambles *Rubus fruticosus* and hawthorn *Crataegus monogyna* and elder *Sambucus nigra* were

frequent, particularly at the edge of the woodland. Holly *Ilex aquifolium* and yew *Taxus baccata* were also found occasionally within the understorey layer (TN3, Photograph 3). Tall herbs; cow parsley *Anthriscus sylvestris*, common nettle *Urtica dioica* and common hogweed *Heracleum sphondylium* bordered the informal footpath and some sections of the woodland edge. Sycamore, ash and oak samplings were abundant within clearings created from natural tree fall and there were good quantities of deadwood, particularly within the southern part of the woodland (TN4 & TN5, Photograph 4 & 5).

#### **Scrub vegetation**

- 3.1.6 Dense mature stands of scrub vegetation dominated by hawthorn and elder occur at the edge of the woodland (TN6, Photograph 5). Scrub vegetation comprising hawthorn, elder, yew, holly and brambles was also present within the interior of the woodland.

#### **Tall herbs**

- 3.1.7 A three metre margin of tall herbs; dominated by cow parsley *Anthriscus sylvestris*, abundant common nettle *Urtica dioica* and hogweed and occasional creeping buttercup *Ranunculus repens*, docks *Rumex sp.*, bindweed *Convolvulus arvensis* and cleavers *Galium aparine* occurs along the woodland edge in the north-western part of Area D1 (TN7, Photograph 7). Tall herbs dominated by brambles, nettles, cow parsley and hogweed were also present along the woodland edge and the informal woodland paths (TN8, Photograph 8).

#### **Semi-improved grassland**

- 3.1.8 Regularly mown species poor semi-improved grassland occurs in-between the existing private graves and between these and the woodland edge. The sward was dominated by perennial rye grass *Lolium perenne*, with frequent annual meadow grass *Poa annua*, cock's foot *Dactylis glomerata* and red fescue *Festuca rubra*. Dominant herb species occurring within the sward included daisy *Bellis perennis*, white clover *Trifolium repens*, yarrow *Achillea millefolium* and dandelion *Taraxacum spp.* (TN9, Photograph 9).

#### **Scattered trees and shrubs**

- 3.1.9 Scattered mature trees and shrubs occurred within the grassland habitat and included mature Lombardy poplars *Populus Lombardy*, sycamore, ash, hornbeam *Carpinus betulus*, wild cherry and hawthorn. These increased the structural diversity and the biodiversity interest of the grassland.

#### **Bat roosting habitat**

- 3.1.10 Ivy clad oak and sycamore trees, which were abundant throughout the woodland, offer potential roost habitat. A number of dead and heavily ivy clad mature trees were identified within the woodland habitat immediately south of the application area which were assessed as having MEDIUM/HIGH potential to support a roost (TN2, Photograph 2 and TN10, Photograph 10). The extent of ivy cover made the identification of cavity features difficult, and therefore the woodland habitat as a whole was assessed as

having MEDIUM potential to support a bat roost.

3.1.11 Several mature *Populus sp* situated immediately west of Area D1 had woodpecker holes, large cavity features and raised bark (TN11, Photograph 11). A dead monolith with woodpecker holes was also identified close to the south-western corner of the site. These trees were assessed as having HIGH potential value to bats as a roost site.

3.1.12 A total of 10 x semi-mature oak, 8 x semi-mature sycamore, 3 x *Prunus sp.*, 1 x *Betula sp.*, 1 x mature hawthorn and 1 x Lombardy poplar would be removed from the woodland either side of the clearing (see Photographs 1 and 2, Appendix A3).

- The Lombardy poplar (T515) was not found to support suitable roost features. Its value to bats as a roost site was assessed as NEGLIBIBLE.
- Wild cherry (T615, T620, T621, and T622) occurring along at the western edge of the clearing were young and did not support suitable roost features. Their value to bats was assessed as NEGLIGIBLE..
- Semi-mature oaks (T510, T610, T611, T612, T616A, T618, T619, T623a, T625, T631) and sycamores (T602, T613, T616, T617, T623, T627, T628, T629) occurring at the woodland edge were mostly leggy (as a result of competition for light) and lacked notable cavity features. Potential roost habitat was limited to ivy cover which was sparse (where present) compared to other trees located in the interior of the woodland. The overall value of these trees to roosting bats was assessed as LOW.
- The birch (T634) was not specifically identified during the Preliminary Bat Assessment but based on information provided within the arboricultural survey, suitable crevice/cavity features may be present and warrant further investigation prior to its removal.
- None of the mature hawthorn (i.e. T614) within the application site were considered suitable to bats as a roost site. Instead they offered value as foraging habitat.

#### ***Bat foraging habitat***

3.1.13 Area D1 supports suitable foraging habitat for edge feeding species (e.g. *Pipistrellus sp*, Leisler's bat and serotine) as well as bat species that feed within closed (e.g. *Myotis sp*) and open (e.g. noctule) environs. The habitat comprised a diversity of native tree, shrub and herbaceous species that typically support high insect biomass. Of particular significance is the dominance of oak within the woodland (a species known to support as many as 284 invertebrate species) together with an understorey of mature hawthorn, elder, brambles and ivy and standing and fallen deadwood. Herb species within the woodland and along the woodland edge further enhance the structural diversity of the habitat by offering additional sheltered refuges and nectar and pollen sources for invertebrates.



**Bat commuting habitat**

- 3.1.14 The woodland edge is a prominent linear feature within the context of the site. It is well connected to the mature tree lines located at the boundary of the Cemetery and offers a potential flight line for commuting bats.

**3.2 EVENING BAT EMERGENCE AND ACTIVITY SURVEYS**

- 3.2.1 Two evening bat emergence and activity surveys were completed in May and September 2015. The results of these surveys are shown in Appendix A4. This includes details on the weather conditions, a timeline of all bat contacts and maps showing bat activity observed during the surveys (Plans 7 and 8).

**May 2015**

- 3.2.2 Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P.pygmaeus* and Leisler's bat *Nyctalus leislerii* were recorded.
- 3.2.3 Soprano pipistrelle were noted at 2 minutes before sunset from within the interior of the woodland in the southern part of the site. The location of the roost was not confirmed but based on the number of bats seen, any roost occurring in this area is likely used by single or low numbers of soprano pipistrelle bats.
- 3.2.4 Common pipistrelles were also recorded during their typical emergence period in both the northern and southern parts of the site. The earliest records were at 16 minutes after sunset. One bat was seen commuting northwards along the western boundary of the site and the other was seen feeding along the woodland edge. These records suggest that a common pipistrelle roost likely occurs within habitat close to the site, rather than the site itself.
- 3.2.5 Common pipistrelles were recorded most often and foraging activity was concentrated along the woodland edge. Higher levels of feeding activity were observed in the north-western part of Area D1 where there was a gradation of woodland, scrub, tall herbs, and scattered tree and shrub vegetation.
- 3.2.6 Soprano pipistrelles were also observed feeding along the woodland edge. During the early part of the survey, most records were from within the interior of the woodland where bats were seen feeding at canopy height, particularly within small clearings created from natural tree fall in the southern part of the site (TN3, 4 & 5).
- 3.2.7 A single pass by a Leisler's bat was picked up (by the unmanned detector) which was indicative of commuting activity.

**September 2015**

- 3.2.8 Common pipistrelle, soprano pipistrelle and noctule *Nyctalus noctula* were recorded during the survey.
- 3.2.9 The first record was of a soprano pipistrelle bat at 6 minutes after sunset from the interior of the woodland

in the southern part of the site. No bats were seen to emerge from any of the trees to confirm the location of a roost site.

- 3.2.10 A single common pipistrelle bat was recorded during in the emergence period at 18 minutes after sunset. Bat contacts were faint and likely represent a bat feeding at the canopy of the woodland.
- 3.2.11 Common pipistrelles were recorded most often and foraging activity was concentrated at the canopy of the woodland, along the woodland edge and at the interface between the woodland and grassland habitat, within the clearing in the southern part of the site.

### **3.3 STATIC DETECTOR SURVEYS**

- 3.3.1 Bat activity within Area D1 was monitored using static un-manned detectors during May (2 locations; 10 nights) and September 2015 (3 locations; 7 nights). The location of the detectors is shown in Appendix A5, Plan 9. The results of the surveys are summarised in Appendix A5 together with information on sunrise/sunset times and the weather conditions (minimum temperature and rainfall) during the surveys.

#### ***May 2015***

- 3.3.2 Common pipistrelle and soprano pipistrelle were noted during the survey.
- 3.3.3 Soprano pipistrelles were recorded before sunset on 2 out of 10 survey nights and within 10 minutes after sunset on a further 4 nights by the detector (D2) located within the interior of the woodland (see Table 4 below). These data suggest that a soprano pipistrelle roost likely occurs within one of the trees located in the southern part of the site. Based on the number of records noted and field evidence from the emergence and activity survey, the roost site is likely to be used by single or low numbers of soprano pipistrelle bats.
- 3.3.4 Common pipistrelles were recorded during the emergence period on all survey nights from both locations. The earliest record was at 6 minutes after sunset, noted at the north-west corner of the site. Records were also noted within 20 minutes of sunrise (see Table 3). These findings suggest that a common pipistrelle roost likely occurs within the immediate vicinity; i.e. within one of the trees located in or adjacent to the northern part of Area D1 or one of the residential properties situated west of the site.
- 3.3.5 Common pipistrelle and soprano pipistrelle feeding activity was recorded by both detectors. A greater number of contacts were reported by detector D1, located in the north-western corner of Area D1. The habitat in this part of the site comprised a mosaic of woodland edge, scrub and tall herbs.
- 3.3.6 Fewer bat records were noted from the interior of the woodland. This is likely to be due (in part) to the detectability of the microphone such that there will be reduced sensitivity to pick up echolocation calls of bats feeding at canopy height through the dense vegetation.

- 3.3.7 Night time temperatures were below the recommended 8°C minimum on 5 out of 10 nights, and may be a contributing factor to the absence of other species being recorded.

**Table 3: The time of the first and last bat records noted by static detector D1 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
18/05/15	+17	+19	-29	-26
19/05/15	+21	+27	-31	N/A
20/05/15	+9	+20	-21	-26
21/05/15	+17	+20	-27	-31
22/05/15	+6	N/A	-19	N/A
23/05/15	+26	N/A	-22	-19
24/05/15	+21	N/A	-35	-33
25/05/15	+6	N/A	-32	N/A
26/05/15	+17	N/A	-37	N/A
27/05/15	+11	N/A	N/A	N/A

**Table 4: The time of the first and last bat records noted by static detector D2 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
18/05/15	+25	N/A	N/A	N/A
19/05/15	+23	N/A	-47	N/A
20/05/15	N/A	+2	-32	N/A
21/05/15	+19	+7	-38	N/A
22/05/15	N/A	-13	N/A	-14
23/05/15	+24	+5	N/A	N/A
24/05/15	+25	N/A	-26	-28
25/05/15	+12	-8	N/A	N/A
26/05/15	+17	+21	-56	N/A
27/05/15	+20	+9	-48	-61

### **September 2015**

- 3.3.8 Common pipistrelle, soprano pipistrelle and noctule were noted during the survey. Common pipistrelle and soprano pipistrelle were noted during the emergence period by all three detectors. Most early records for common pipistrelle bats were noted by detectors D3 and D4, within the interior of the woodland. Soprano pipistrelle were noted during the emergence period on one night (see Tables 5-7 below).
- 3.3.9 Noctule were noted as single bat passes and were considered to be bats commuting over the site.
- 3.3.10 Bat activity was significantly lower during the September survey compared to the May survey. This is likely

due to less favourable weather conditions noted during the survey period as well as the positioning of the detectors within dense vegetation which will have reduced the detectability of the microphones.

**Table 5: The time of the first and last bat records noted by static detector D3 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
09/09/15	N/A	N/A	N/A	N/A
10/09/15	N/A	N/A	N/A	N/A
11/09/15	+12	N/A	N/A	N/A
12/09/15	+22	N/A	-18	N/A
13/09/15	+13	N/A	-22	N/A
14/09/15	N/A	N/A	N/A	N/A
15/09/15	+13	N/A	N/A	N/A

**Table 6: The time of the first and last bat records noted by static detector D4 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
09/09/15	+16	N/A	N/A	N/A
10/09/15	N/A	N/A	N/A	N/A
11/09/15	N/A	+11	-13	N/A
12/09/15	+12	N/A	N/A	N/A
13/09/15	N/A	N/A	-30	N/A
14/09/15	N/A	N/A	N/A	N/A
15/09/15	N/A	N/A	N/A	N/A

**Table 7: The time of the first and last bat records noted by static detector D5 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
08/09/15	+29	N/A	N/A	N/A
09/09/15	N/A	N/A	N/A	N/A
10/09/15	N/A	N/A	N/A	N/A
11/09/15	+19	N/A	+21	N/A
12/09/15	+34	N/A	N/A	N/A
13/09/15	+12	N/A	N/A	N/A
14/09/15	N/A	N/A	N/A	N/A

## 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1 SITES OF IMPORTANCE FOR NATURE CONSERVATION

5.1.1 Area D1 forms part of a Borough Grade II Site of Importance for Nature Conservation known as Camberwell New Cemetery, Honor Oak Crematorium and Honor Oak Sports Ground. The proposals would result in a reduction in the extent of secondary woodland for which the site was designated. However, the area of woodland that would be cleared is small in extent and plans to provide new planting with mixed woodland species in the south-eastern part of the application area should adequately compensate for the loss of secondary woodland habitat. Furthermore, the biodiversity enhancements; such as the laying of species rich wildflower tuft, the establishment of wildflower meadow and the provision of habitat refuges (bat boxes, bord boxes, log piles and hibernaculum); which are proposed within the landscape designs, should enhance the nature conservation value of the site in the long-term.

### 5.2 ROOST SITES

5.2.1 The 24 trees that are scheduled for removal have LOW or NEGLIGIBLE value as a roost site. (NB: Birch (T634) may support features of MEDIUM or HIGH potential value as a roost and this tree should be surveyed prior to its removal).

5.2.2 There is a HIGH risk of a soprano pipistrelle roost occurring within one of the trees located adjacent to the application area. Roost sites are likely to be transient and used by single or low numbers of bats. At a population level, the significance of the roost site(s) is LOW.

5.2.3 Tree felling activities within the immediate vicinity of a roost could also cause short term disturbances to roosting bats (if present). The removal of trees which currently offer sheltering of the woodland interior may also alter the environmental conditions of the retained woodland habitat, which could reduce the value on any roost sites present. An appropriate mitigation strategy would need to be followed during tree felling activities to avoid adverse impacts to roosting bats (see Section 5.5 below).

5.2.4 A common pipistrelle roost used by single or low numbers of bats likely occurs outside of the application area, within the vicinity of the north-western corner of Area D1. The impact of the works on this roost site is assessed as NEGLIGIBLE since the roost will not be directly impacted and it is sufficient distance from the works area to eliminate disturbance impacts.

5.2.5 Only low numbers of noctule and Leisler's bats were noted and all records were outside of their typical emergence period and characteristic of commuting activity. The likelihood of roost sites for these species being present within the survey area is NEGLIGIBLE.

### **5.3 FORAGING HABITAT**

- 5.3.1 Area D1 provides a foraging resource for common pipistrelle and soprano pipistrelle bats. Notable habitat features used by foraging bats included openings within the woodland canopy, the woodland edge and the interface between woodland, scrub, tall herbs and mown amenity grassland. Given the small extent of area of woodland habitat that will be removed, the overall impact on foraging bats is assessed as LOW.
- 5.3.2 Proposals to plant new native mixed woodland species at the edge of the existing woodland, the laying of wildflower turf/flowering lawn mixtures and seeding of disturbed grassland areas with wildflowers to be managed as meadow will enhance the biodiversity value of Area D1 in the long-term and compensate for the loss of the existing bat foraging resource. The overall impact of the proposals on foraging bats is therefore assessed as NEGLIGIBLE.

### **5.4 COMMUTING HABITAT**

- 5.4.1 Observations of commuting common pipistrelle and soprano pipistrelle bats and records of noctule and Leisler's bat confirm that the survey area falls along a bat flight line.
- 5.4.2 The amount of woodland habitat that would be removed is small in extent and will not impact on established bat flight lines. Instead, an increase in the extent of woodland edge habitat and the planting of native trees along footpaths should enhance connectivity between the application area and the wider cemetery site.

### **5.5 MITIGATION STRATEGY FOR THE PROPOSED WORKS**

- 5.5.1 The removal of woodland habitat from Area D1 could result in the loss or disturbance of a soprano pipistrelle roost. An appropriate mitigation strategy These include:
- The birch (T634) was not specifically identified during the Preliminary Bat Assessment but based on information provided within the arboricultural survey, suitable crevice/cavity features may be present and warrant further investigation prior to its removal.
  - Tree works should ideally be undertaken between mid-September and the end of October to avoid the bat hibernation seasons and bird nesting season. Works should only proceed under dry conditions and when day and night time temperatures are 8°C or above.
  - Tree surgeons should be briefed on bats and their field signs, features that offer suitable bat habitat and the bat legislation prior to the commencement of works. The contact details of a licensed bat ecologist should be made available.
  - All trees should be felled in sections that are lowered to the ground, (rather than clear felled) to minimise disturbances to the surrounding habitat.

- Trunks or stems that have cavity features should be sectioned at least 500mm above and below the cavity so that it remains intact. Ideally, these sections should be ratchet strapped to a surrogate tree within the immediate vicinity (a Category A or B tree that will not be impacted by the works), at approximately the same height and altitude to how it was originally found so that the features continue to be available to roosting bats.
- If bats are discovered during works, further works to the tree must stop immediately and advice sought from a licensed bat ecologist on how best to proceed.
- Birds were confirmed to be nesting on site. To ensure compliance with the bird legislation and avoid impacts to nesting birds, any vegetation clearance works should be completed during the period of September to February, which is outside the main bird nesting season. Some bird species may nest outside this core period and therefore due care and attention should be given when undertaking potentially damaging works at any time of year. All potential nesting habitat should be checked by a suitably qualified ecologist prior to the commencement of works. If nesting birds are found, works within a 5m radius would need to be postponed until the young have fledged.

5.5.2 The landscape designs include the installation of No.8 bat boxes. These should be installed prior to the commencement of tree removal works so as to provide alternative undisturbed roosting opportunities away from the works area. Given the young age of the existing woodland and the limited number of mature trees with significant cavity features, the installation of bat boxes should enhance bat roosting opportunities at the site in the short- and long-term. The installation of an additional 2 bat boxes is recommended to ensure good coverage of roosting opportunities throughout the site. All bat boxes should be paired with a bird nest box to minimise competition of bat boxes by nesting birds. They should only be installed on Category A or B trees that are assessed as having a life expectancy of >25 years.

5.5.3 Bat and bird boxes should be surveyed annually in September or October by a suitably qualified ecologist. All nesting material should be removed and vegetation should be cleared from around the box entrances (as required) to maintain a clear entry path. All data collected from these surveys should be sent to the local records centre.

5.5.4 Where possible, bat and bird boxes should be provided throughout the whole cemetery site to enhance the value of the cemetery for roosting bats and nesting birds in the long term.

## REFERENCES

BAT CONSERVATION TRUST (2012). *Bat Surveys – Good Practice Guidelines - 2nd edition*. Bat Conservation Trust, London

HMSO (1981). *The Wildlife and Countryside Act (WCA)* (as amended).

HMSO (2000). *The Countryside and Rights of Way Act (CRoW)*.

HMSO (2010). *The Conservation of Habitats and Species Regulations 2010*.

JNCC (2004). *Bat Worker's Manual*. 3<sup>rd</sup> Edition. Edited by A.J. Mitchell-Jones & A.P. McLeish, Joint Nature Conservation Committee, Peterborough.

LONDON BAT GROUP (2015). Bat records as requested by Huma Pearce, Mostlybats – Records within 4 x 4km square centred on of TQ34701 74173.

LONDON BIODIVERSITY PARTNERSHIP (2007). *London Biodiversity Action Plan* [Online]. Available at: <http://www.lbp.org.uk/londonap.html>.

NATURAL ENGLAND (2013). Natural England Technical Information Note TIN092.

<http://publications.naturalengland.org.uk/publication/31005>

NERC (2006). *Habitats and species of Principal Importance*. Available at:

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>

ODPM (2005) *Biodiversity & Geological Conservation: Statutory Obligations & Their Impact Within The Planning System*. Government Circular.

Southwark Council (2012). *Southwark Biodiversity Action Plan 2012-2018. Making Space for Natural Neighbours*. Final Draft 2012.



## **A1: LEGISLATION**

## BAT LEGISLATION

All bat species in the UK are fully protected under The Conservation (Natural Habitats, &c.) Regulations 2010 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or taking (capture) of bats
- Deliberate disturbance of bats in such a way as to:
  - impair their the ability to survive, breed, or rear or nurture their young; or
  - affect significantly the local distribution or abundance of bat species; or
- impair their ability to hibernate or migrate
- Damage or destruction of a bat breeding site or resting place i.e. roost
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

All bat species in the UK are also protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, it is an offence to:

- Intentionally or recklessly disturb any bat while it is occupying a structure or place which it uses for shelter or protection
- Intentionally or recklessly obstruct the access to any place of shelter or protection used by bat(s)
- Sell, offer or expose for sale, possess or transport a bat(s) for the purpose of sale.

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will need to be applied for to allow derogation from the relevant legislation i.e. for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young, hibernate, migrate). In certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded *de facto* protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost.

## BIRD LEGISLATION

All birds, their nests and eggs are protected under Sections 1-8 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to kill, injure or take any wild bird, or to take or destroy their eggs. It is also an offence to take, damage or destroy the nest of any wild bird while it is in use or being built. Certain species receive additional special protection under Schedule 1 of the Act.

- Intentional or reckless disturbance while it is building a nest or is in, on or near a nest containing eggs or young;
- Intentional or reckless disturbance of dependent young of such a bird.

Species listed under Annex 1 of the European Community Directive on the conservation of Wild Birds (79/409/EEC) qualify sites for designation as a Special Protection Area (SPA) if certain selection criteria are met, such as a site supports internationally important populations of an Annex 1 species.

## **CONSERVATION (NATURAL HABITATS ETC) REGULATIONS 2010**

The species protection provision of the EC Habitats Directive 1992, as implemented by the Conservation of Habitats and Species Regulations 2010, comprises three “derogation tests” which must be applied by the Local Planning Authority when deciding whether to grant planning permission for a development that could harm a European Protective Species. The three tests are that:

- The activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety
- There must be no satisfactory alternative; and
- Favourable Conservation Status (FCS) of the species must be maintained.

It is the responsibility of the applicant to submit sufficient information to address these tests when applying for planning permission. For development activities, an EPSM Licence application can only be obtained after planning permission has been granted. However, the granting of planning permission does not guarantee that a licence will be issued by the relevant countryside agency.

## **NATIONAL PLANNING POLICY FRAMEWORK (2012)**

The National Planning Policy Framework (NPPF) (2012) sets out the Government’s national policies on different aspects of planning in England. Section 10 paragraphs 109 to 125 details planning policies on the conservation and enhancement of the natural environment. Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

In summary:

The planning system should contribute to and enhance the natural and local environment by: ‘minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.’ (NPPF Section 10, para 109)

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused (Section 10, para 118).
- Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted (Section 10, para 118).
- Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted (Section 10, para 118).
- Opportunities to incorporate biodiversity in and around developments should be encouraged (Section 10, para 118).

- Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss (Section 10, para 118).
- Potential Special Protection Areas and possible Special Areas of Conservation, listed or proposed Ramsar sites and sites identified or required as compensatory measures for adverse effects on European sites, should be given the same protection as European sites (Section 10, para 118).
- The presumption in favour of sustainable development (para 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Section 10, para 119).
- Planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation (Section 10, para 125).

Local planning authorities must take account of the conservation of protected species when determining planning applications. The presence of protected species is a material consideration when assessing a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. This requirement has important implications for bat surveys as it means that, where there is reasonable likelihood of bats being present and being affected by the development, surveys must be carried out before planning permission is considered' (BCR 2012). In order for the Local Planning Authority to adequately assess a development proposal against National and Local Planning Policy, full comprehensive ecological surveys need to be carried out and suitable mitigation strategies compiled prior to the submission of any planning application. This information will be reviewed by the Local Planning Authority in consultation with the relevant countryside agency and other conservation bodies.

Any developer should, in the first instance, consult the relevant Local Plans to assess the suitability of their proposal (refer to NPPF Section 10 paras 113 to 117).

## **NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006 (NERC)**

Part 3, Section 40 of the NERC Act 2006 states that 'every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity', otherwise known as the Biodiversity Duty. Under Section 41 of the Act, the Secretary of State must publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity. This list is based on those species listed in the UK Biodiversity Action Plan (BAP) as priority species. The S41 list replaces the list published under Section 74 of the Countryside and Rights of Way (CRoW) Act 2000.

## **BIODIVERSITY ACTION PLAN**

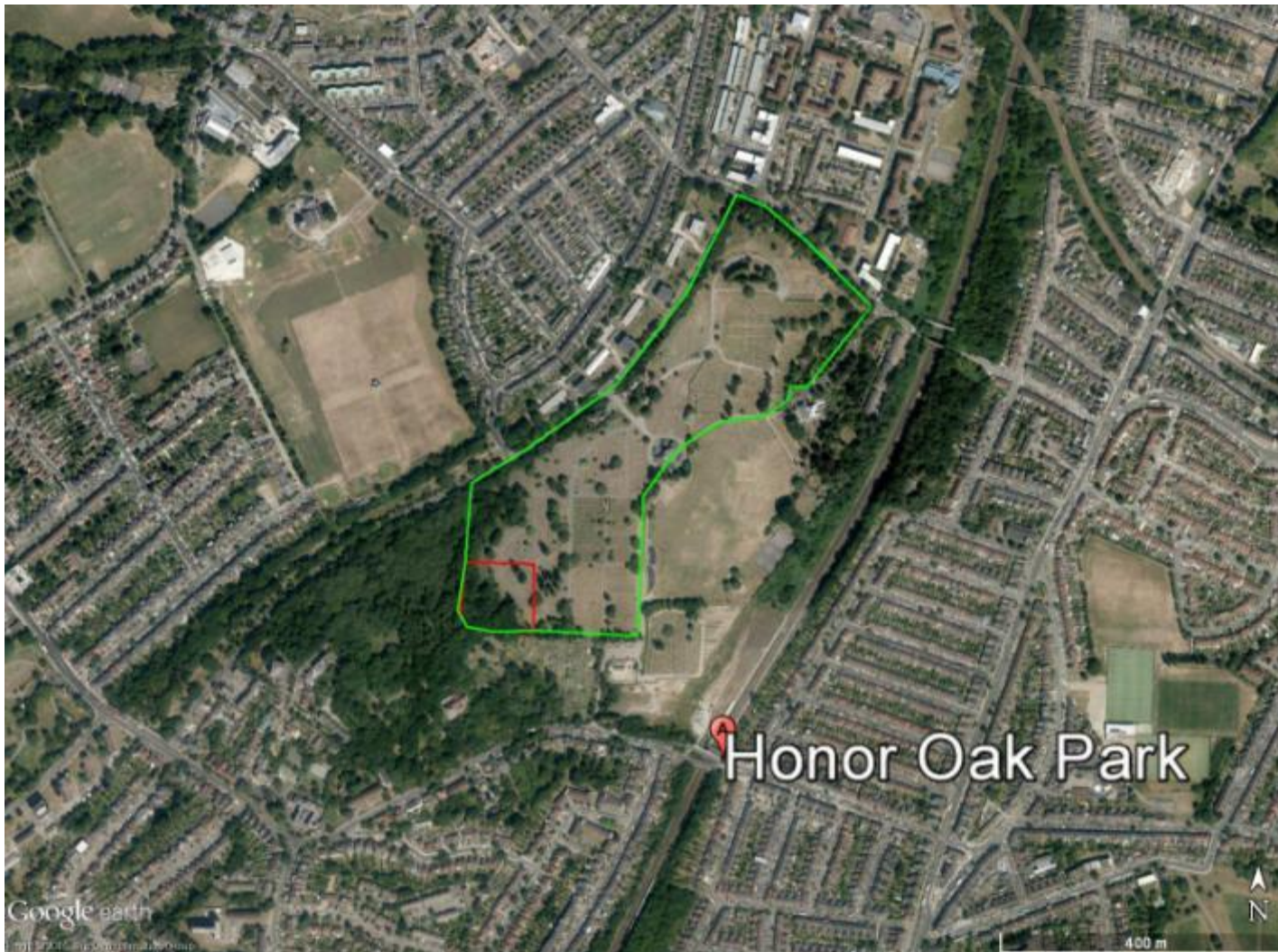
In 1994 the UK Government published its response to the Convention on Biological Diversity that it signed along with over 150 other nations at the Rio Earth Summit in 1992. Biodiversity – the UK Action Plan (HM Government 1994) and subsequent publications (e.g. UK Steering Group 1995) set out a programme for the national Biodiversity Action Plan (BAP), including the development of targets for biodiversity, and the techniques and actions necessary to achieve them. UK BAP priority habitats were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The UK BAP priority species were

those that are of conservation concern, either because they are rare in an international or national context or have undergone serious declines in their populations in recent years. The original lists of UK BAP priority habitats and UK BAP priority species was created between 1995 and 1999, and was revised in 2007, following publication of the Species and Habitats Review Report. Following this review, the list of UK BAP priority habitats increased from 49 to 65 and the list of UK BAP priority species increased from 600 to 1150.

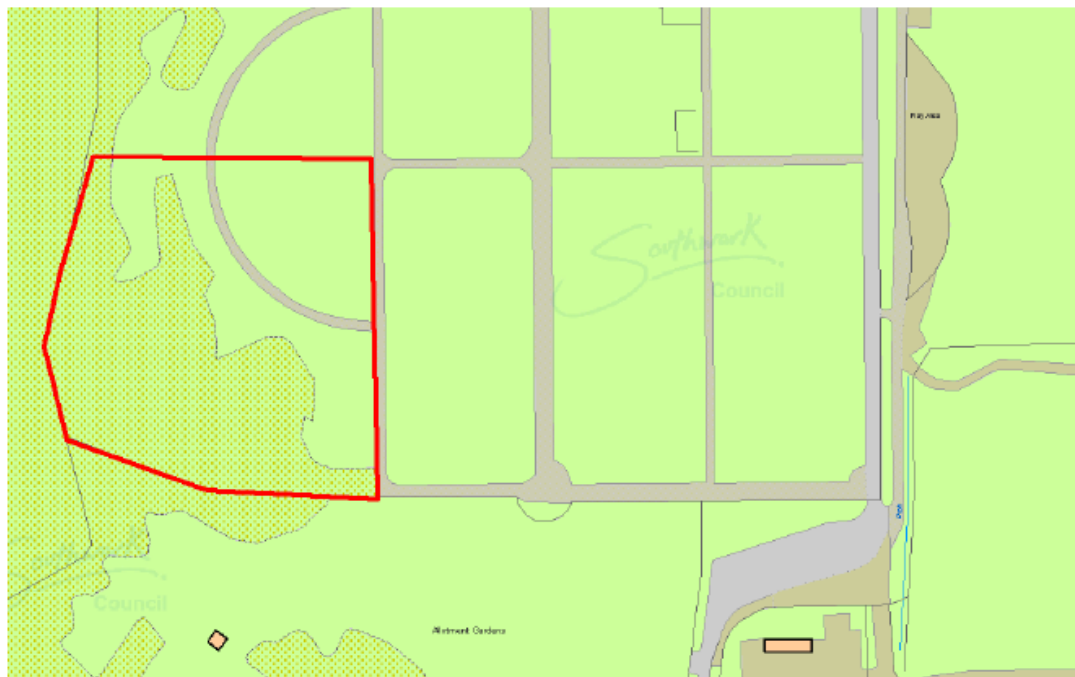
Biodiversity Action Plans (BAPs) set out actions for the conservation and enhancement of biological diversity at national, regional and local level. They consist of both Habitat Action Plans (HAPs) and Species Action Plans (SAPs) and species and habitats listed within these are defined as being of Principal Importance for the Conservation of Biodiversity under Section 41 of the NERC Act 2006. Local authorities must consider these species and habitats when determining planning applications.

**A2: PLANS**

**Plan 1: Aerial view of Camberwell New Cemetery and surrounding area showing the location of Area D1**

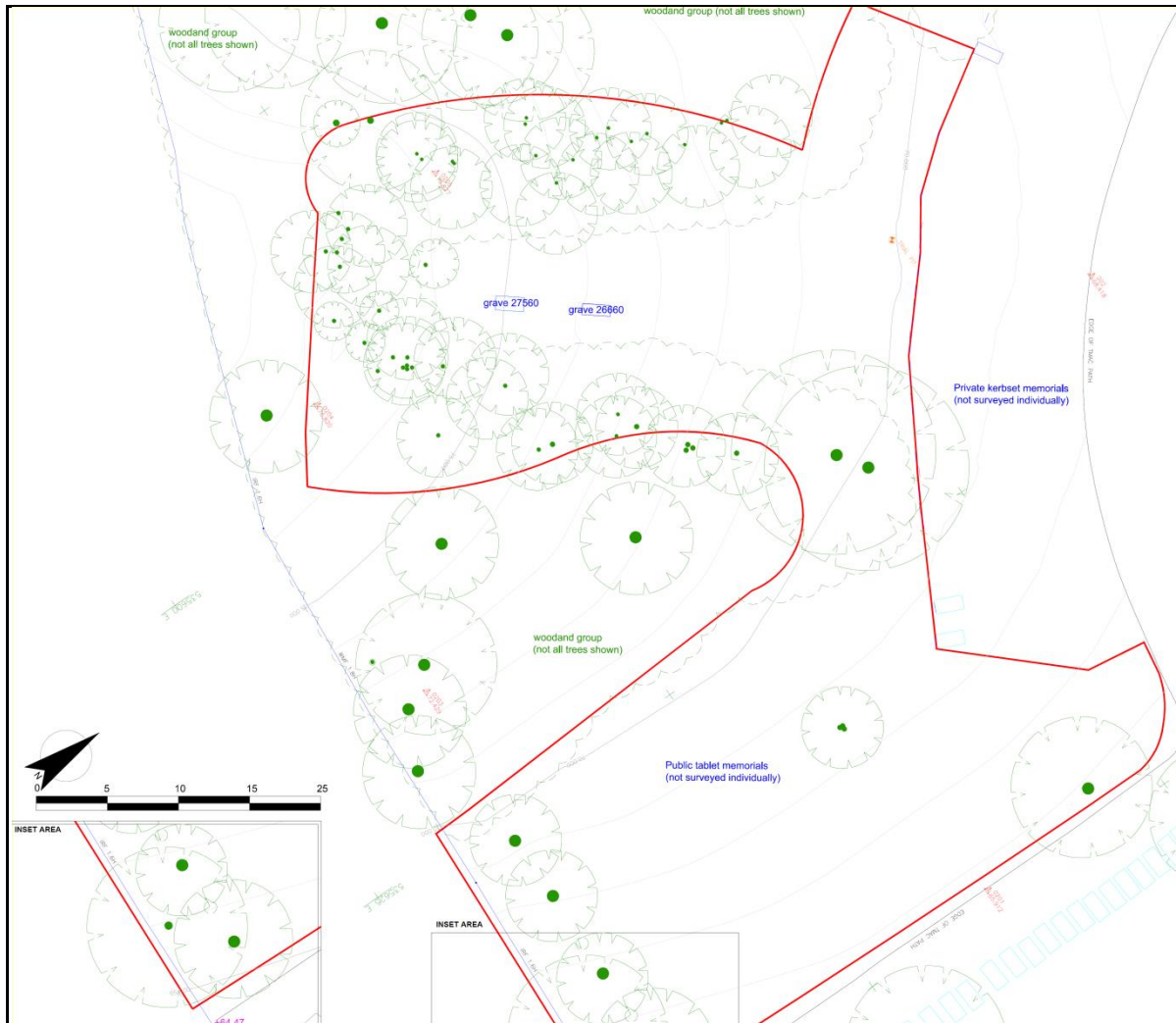


**Plan 2: Location and site plan of Area D1, Camberwell New Cemetery**





**Plan 3: Existing site plan of the area to be impacted by the proposals**







## **A3: HABITAT ASSESSMENT**



**Photograph 1 (TN1):** The application site - comprising secondary woodland and a grassland clearing



**Photograph 2 (TN2):** The application site – woodland edge habitat bordering the grassland clearing



**Photograph 3 (TN3):** Interior of the woodland in the south-west corner of Area D1 (Location of Static Detector 2)



**Photograph 4 (TN4):** Deadwood associated with natural tree fall.



**Photograph 5 (TN5):** Fallen and standing deadwood covered with ivy.



**Photograph 6 (TN6):** Hawthorn scrub along the woodland edge and as mature stands scattered within the grassland



**Photograph 7 (TN7):** Margin of tall herbs along the woodland edge in the north-west part of Area D1



**Photograph 8 (TN8):** Herbaceous vegetation associated with clearing within the woodland





**Photograph 9 (TN9):** Semi-improved grassland between the existing private graves and the woodland

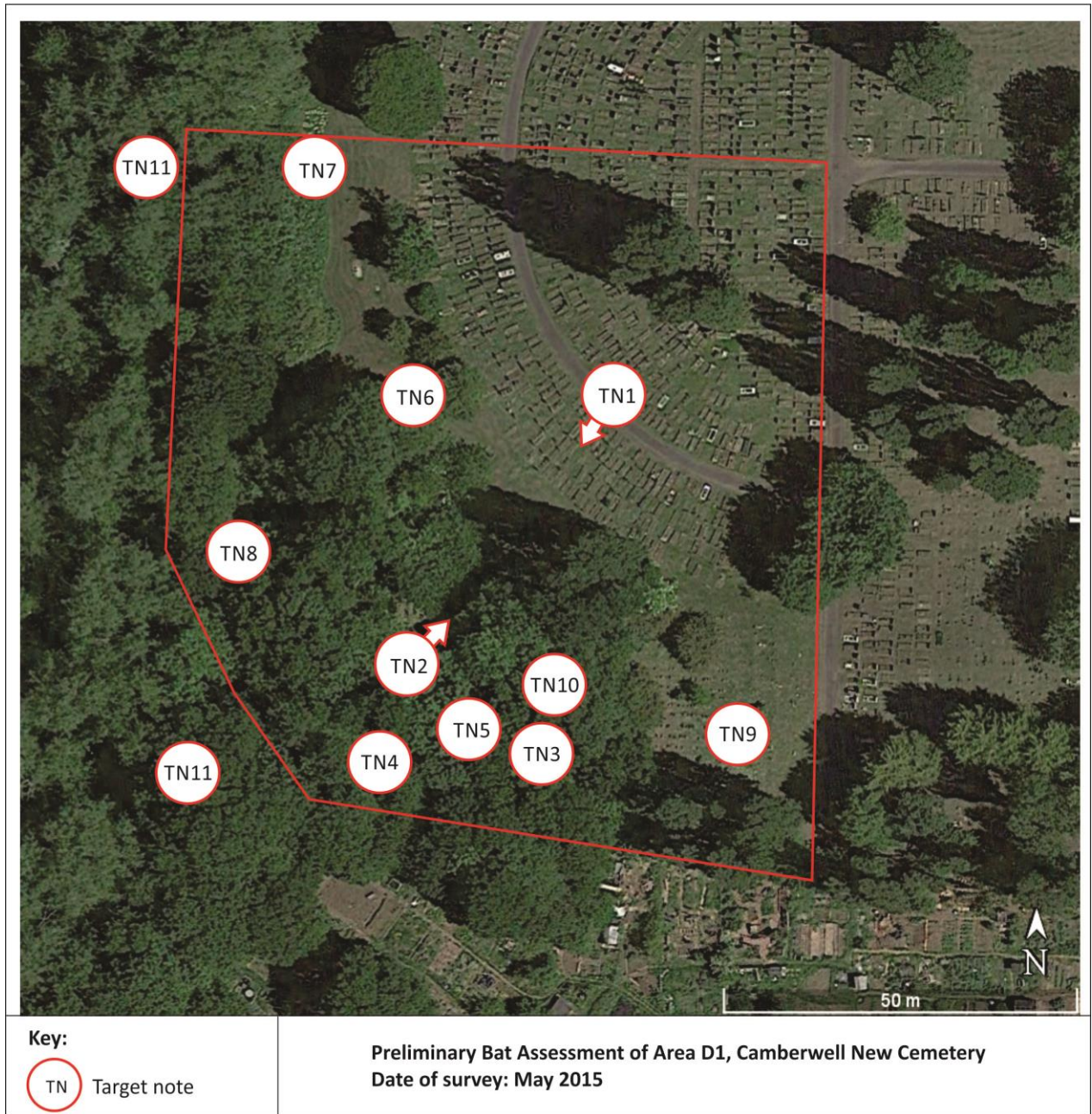


**Photograph 10 (TN10):** Ivy Clad mature oaks and sycamore offer MEDIUM bat roost potential within the context of the site.



**Photograph 11 (TN11):** Poplars immediately west of Area D1 support cavities of HIGH roost potential.

**Plan 6: Location of Target Notes described in the site assessment.**



## **A4: EVENING EMERGENCY SURVEYS**

**KEY:**

Species code	Common name	Scientific name
p45	Common pipistrelle	<i>Pipistrellus pipistrellus</i>
p55	Soprano pipistrelle	<i>P. pygmaeus</i>
Nl	Leisler's bat	<i>Nyctalus leislerii</i>
Nn	Noctule	<i>Nyctalus noctula</i>

**Evening bat emergence and activity survey 28<sup>th</sup> May 2015.**

Start time: 20:44    Sunset: 21:01    End time: 22:30  
 17-15°C, 15% cloud cover, calm.

**Surveyor 1: Northern part of Area D1**

Time	Species	Comments
21:17	p45	Bat commuting pass north along the boundary of the site
21:19 – 21:20	p45	Bat feeding in the woodland clearing just west of the site boundary and passing into the cemetery feeding between the woodland edge and scattered trees
21:22 – 21:23	p45	Bat feeding in the woodland clearing just west of the site boundary and feeding between the woodland edge and scattered trees
21:24	p45	Bat feeding pass
21:25 – 21:28	p45 p55	Bats feeding at the edge of the woodland at canopy height
21:28 – 21:31	p45	Bat feeding at the edge of the woodland in the north of Area D1
21:32	p45	Bat feeding between the scrub and the hornbeam.
21:37 – 21:38	p45	Bat feeding between the scrub and the hornbeam.
21:59	p45 p55	Bat feeding by hornbeam – and scrub
22:03 – 22:20	p45	2-3 bats feeding between the woodland and scrub

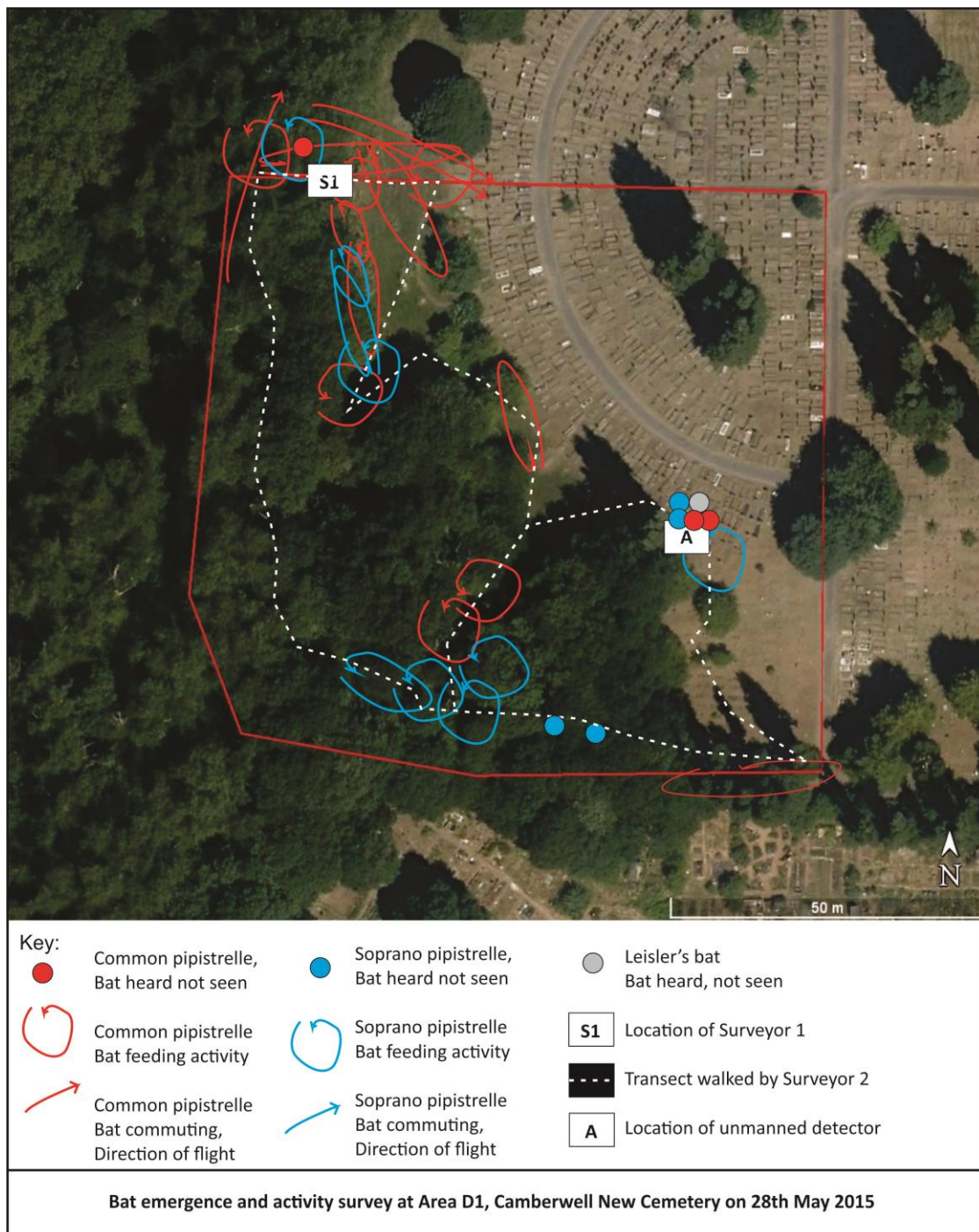
**Surveyor 2: Transect along the woodland path and woodland edge**

Time	Species	Comments
20:59 – 21:04	p55	<b>2 minutes before sunset.</b> Very faint record from within the woodland, not seen – feeding at canopy
21:05-21:07	p55	Feeding in the woodland near to the edge at the transition with the grassland
21:15	p55	Bat still feeding within the woodland , at canopy along the woodland path
21:17 – 21:18	p45	Bat feeding at the woodland edge
21:20	p45	Bat feeding at the edge of the woodland
21:22	p45	Bat feeding in clearing within the woodland
21:25 – 21:26	p45	Bat feeding at the edge of Area D1, near to hornbeam
21:27	p45	2 bat passes south from the north, fed briefly.
21:29	p45	Bat feeding at canopy along the woodland edge recorded half way along the semi-circular path
21:30	p55	Faint feeding record at the southern end of the semi-circular path
21:58 – 22:03	p45 p55	Bats feeding at canopy in- between the woodland edges in the northern part of the site
22:03 – 22:07	p45	Bats feeding at the north-western corner of Area D along the woodland and between the woodland edge and scattered trees and scrub vegetation
22:09	p55	Bat feeding pass at the south-western corner of the woodland
22:13	p45	Bat feeding between the woodland edge in the north-western part of the site
22:14 – 22:15	p45	Feeding in the north of the site

**Static detector : Deployed in front of the poplar and oak during the emergence and activity survey**

Time	Species	Time after sunset/Notes
21:17	p45	16 minutes after sunset
21:58	p55	57 minutes after sunset
22:09	p45	1 hr and 8 minutes after sunset
22:15	NI	1 hr and 14 minutes after sunset
22:15	p45	2 hr and 14 minutes after sunset
22:19	p55	1 hr and 18 minutes after sunset

**Plan 7: Results of the evening bat emergence and activity survey on the 28<sup>th</sup> May 2015**



**Evening bat emergence and activity survey 8<sup>th</sup> September 2015.**

Start time: 19:15

Sunset: 19:31

End time: 21:00

16°C, 100% cloud cover, dry with a light breeze.

**Surveyor 1: Located within the interior of the woodland along the informal path (south)**

Time	Species	Comments
19:37	p55	Bat contact, not seen. <b>6 minutes after sunset</b>
19:49	p45	Bat feeding passes (faint) not seen. <b>18 minutes after sunset</b>
20:08	p45	Faint feeding records, possibly at the canopy
20:13	p45	Bat feeding pass
20:15	p45	Bat feeding passes at canopy
20:16	p55	Brief bat pass
20:18	p45	Bat feeding passes (faint) possibly at canopy
20:23	p45	Bat feeding passes (faint) possibly at canopy
20:26	p55	Bat feeding passes (faint) possibly at canopy
20:27	p45	Bat feeding passes (faint) possibly at canopy
20:31	p45	Bat feeding passes (faint) possibly at canopy
20:35	p45	Bat feeding passes (faint) possibly at canopy
20:40	p45	Bat feeding passes (faint) possibly at canopy

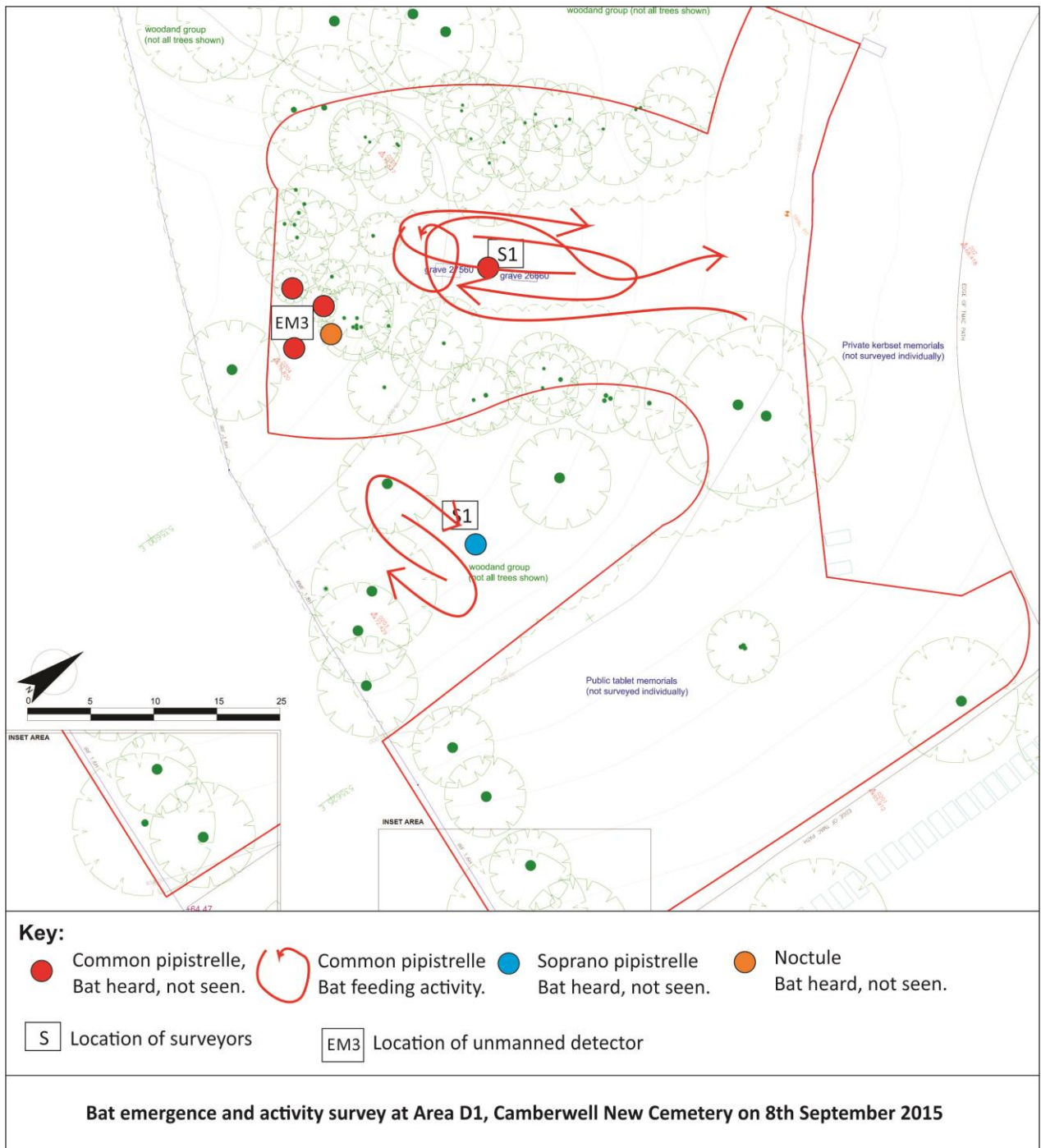
**Surveyor 2: Located within the grassland clearing**

Time	Species	Comments
20:13	p45	<b>Bat pass not seen</b>
20:18	p45	Bat feeding in clearing along the tree line
20:19	p45	Faint feeding record, not seen
20:23	p45	Faint feeding records, not seen
20:27	p45	Bat feeding at woodland edge
20:33	p45	Bat feeding in clearing within the woodland
20L41	p45	Bat feeding at canopy by treefall

**Static detector : Deployed in within a clearing associated with natural tree fall**

Time	Species	Number of records/minute
20:08	p45	2
20:13	p45	1
20:21	p45	2
20:23	p45	1
20:27	p45	1
20:28	p45	2
20:32	Nn	2
20:35	p45	2
20:36	p45	1
20:37	p45	2
20:39	p45	1
20:40	p45	2
20:43	p45	1

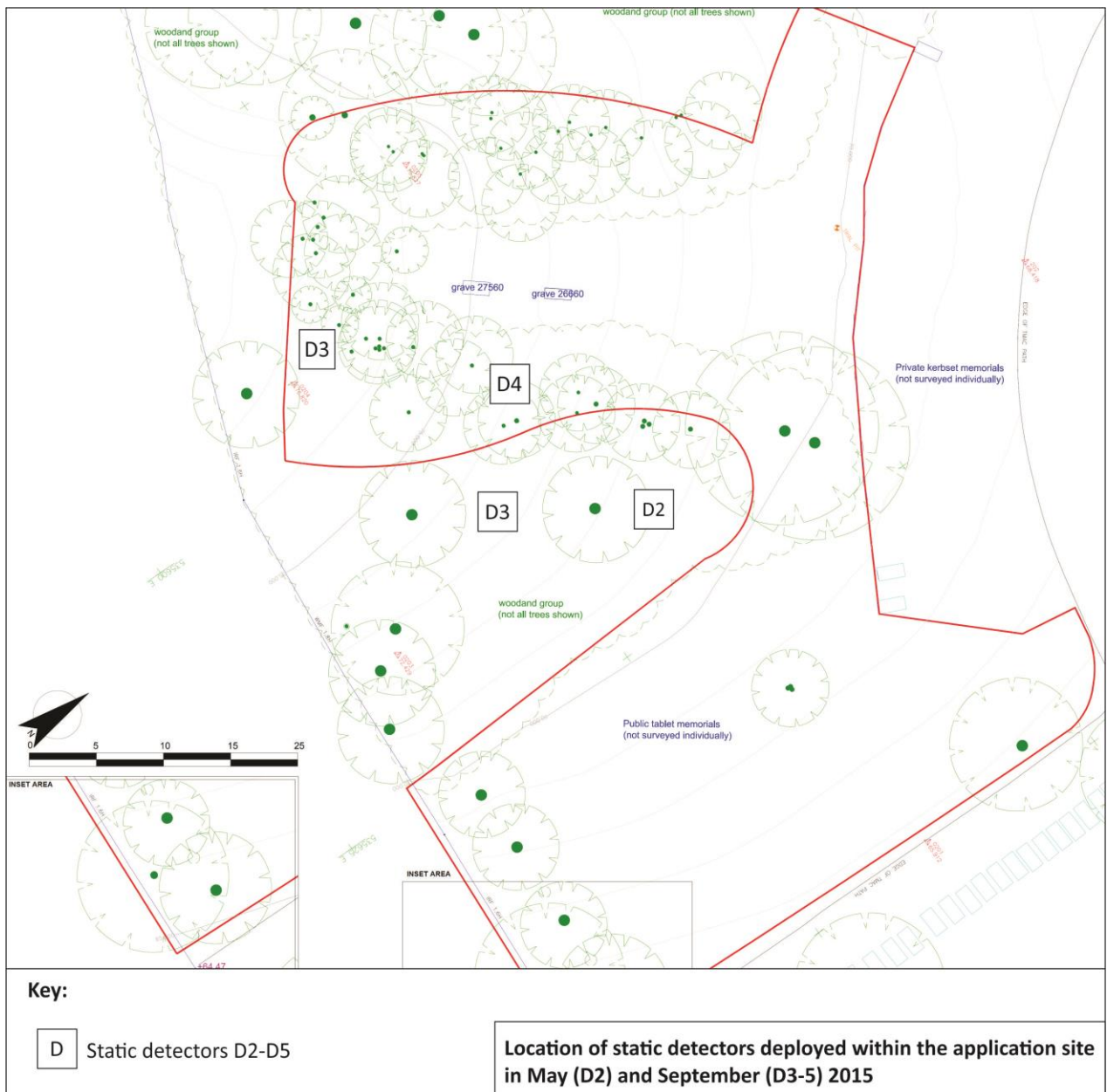
**Plan 8: Results of the evening bat emergence and activity survey on 8<sup>th</sup> September 2015**





## **A5: STATIC DETECTOR SURVEYS**

**Plan 9: Location of static detectors deployed in May (D1 & D2) and September (D3, D4 & D5).**



**NB: D1 was located at the north-western corner of Area D1, outside of the application area.**

**KEY:**

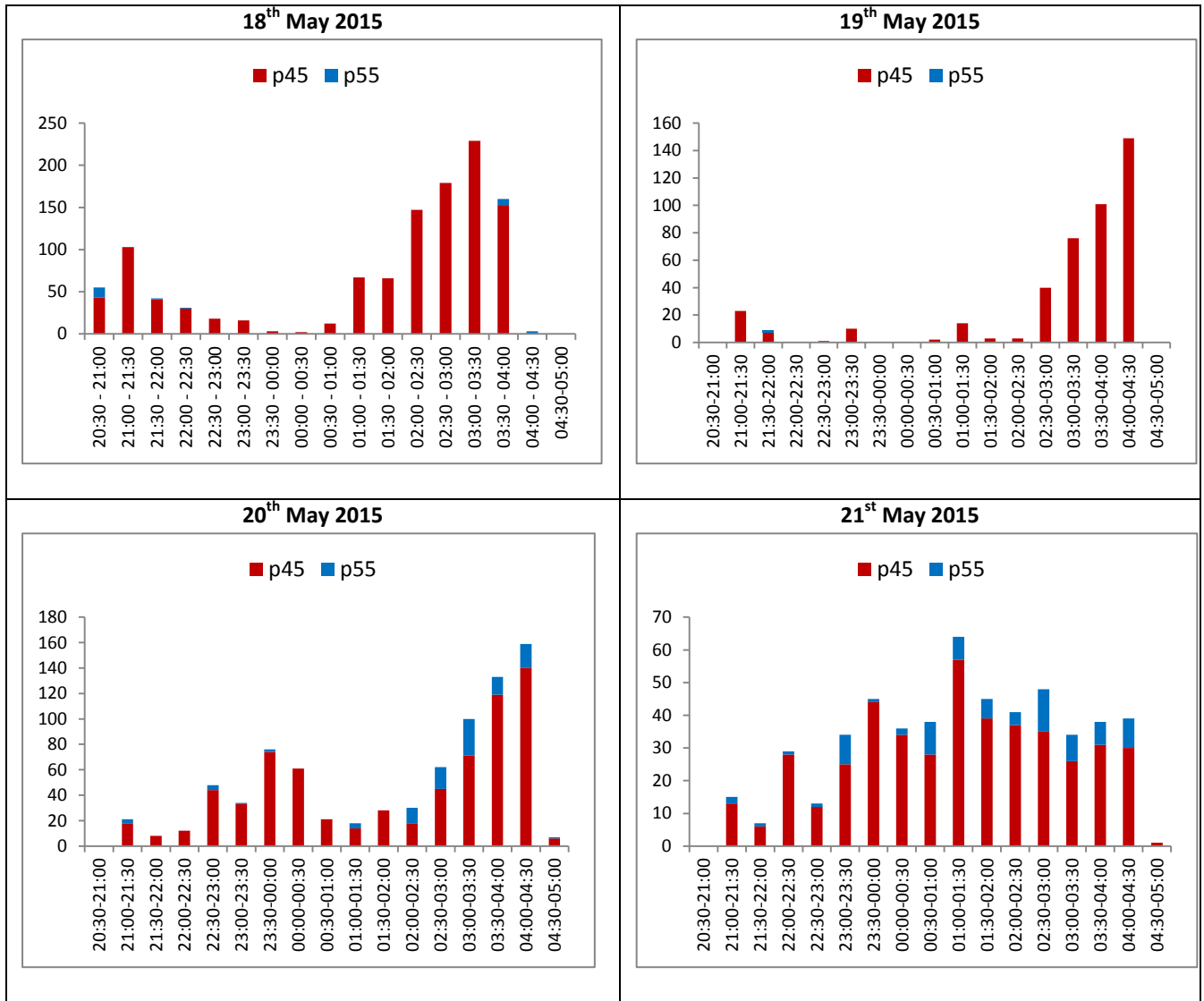
Species code	Common name	Scientific name
p45	Common pipistrelle	<i>Pipistrellus pipistrellus</i>
p55	Soprano pipistrelle	<i>P. pygmaeus</i>
Nn	Noctule	<i>Nyctalus noctula</i>

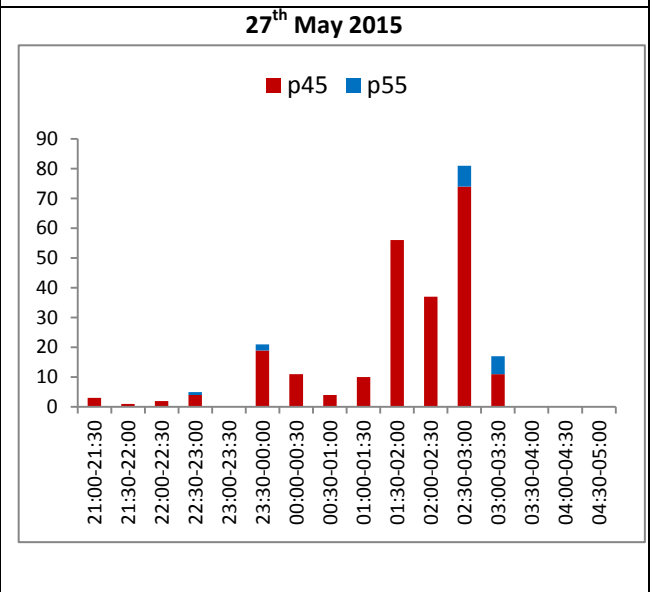
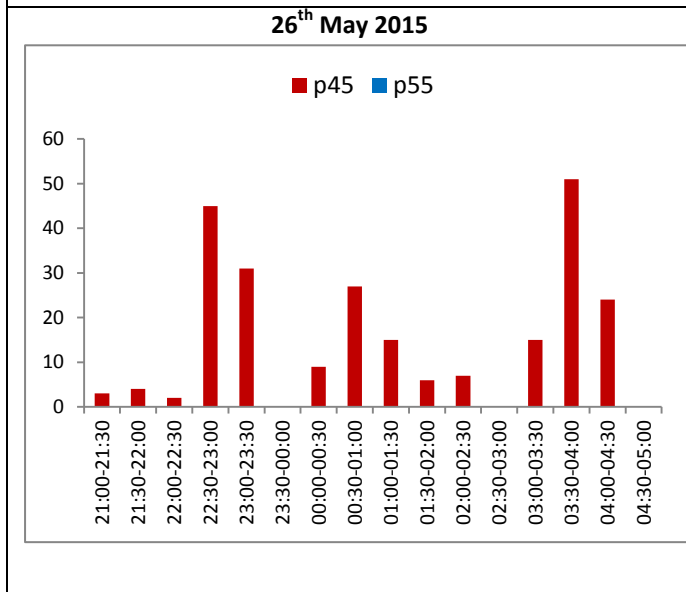
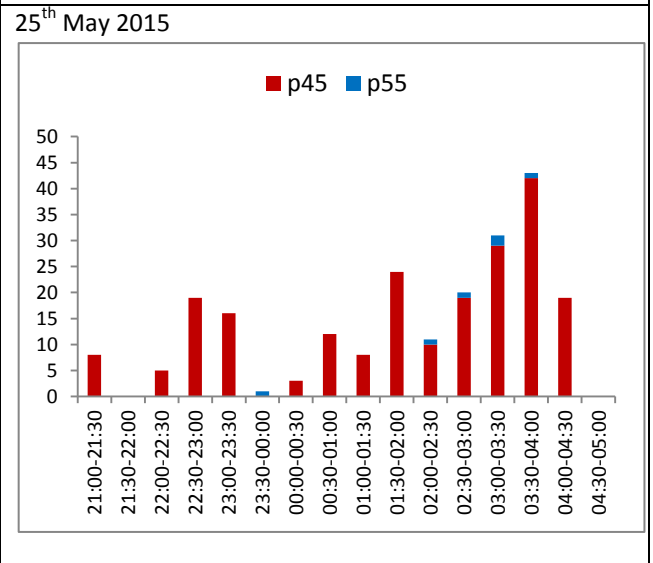
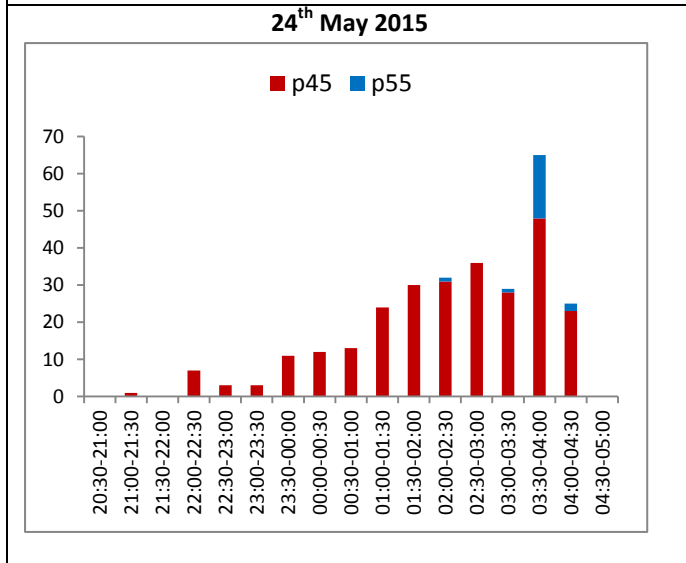
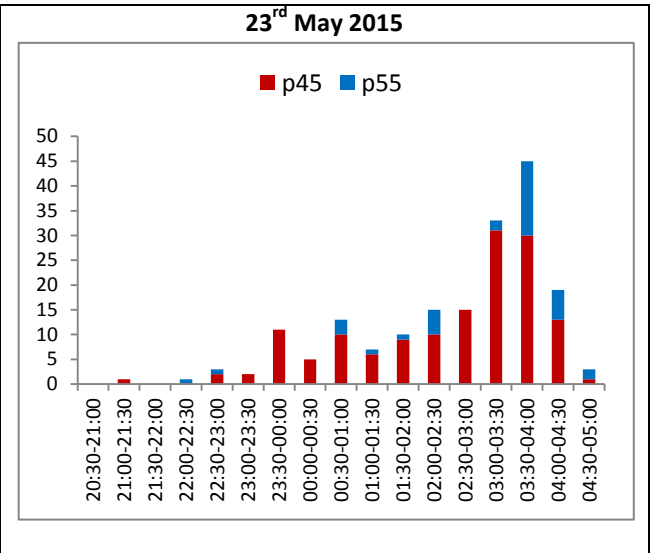
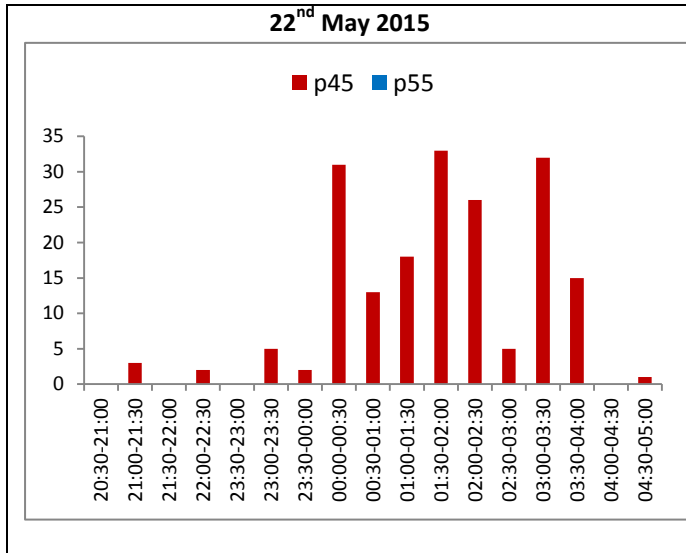
**Static detector survey 18<sup>th</sup> to 27<sup>th</sup> May 2015**

*Weather conditions (Data from weatheronline.co.uk)*

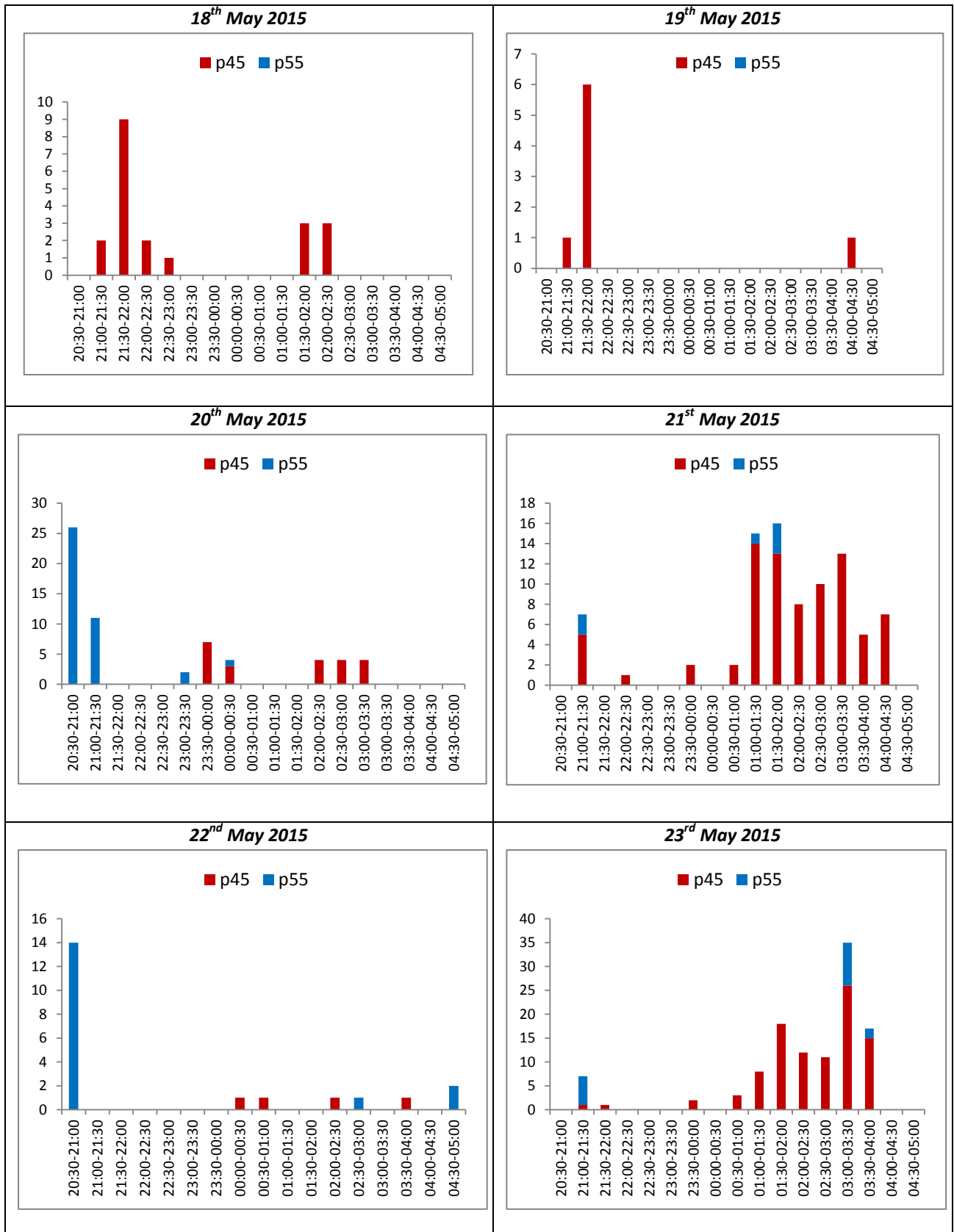
Date	Minimum temperature (°C)	Total rainfall (mm)	Sunset	Sunrise
18/05/15	9	1	20:50	05:01
19/05/15	7	2	20:51	05:00
20/05/15	4	0	20:53	04:58
21/05/15	5	0	20:54	04:57
22/05/15	7.5	0	20:56	04:56
23/05/15	13	0	20:57	04:55
24/05/15	12	0.25	20:58	04:53
25/05/15	9	0	21:00	04:52
26/05/15	9.5	0	21:01	04:51
27/05/15	7.5	0	21:02	04:50

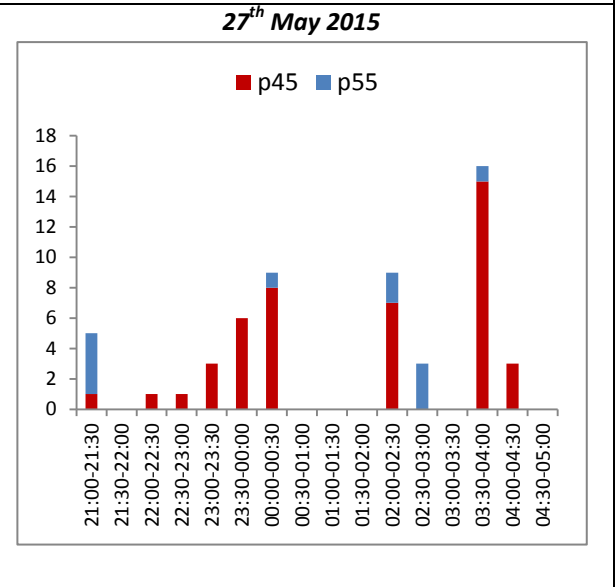
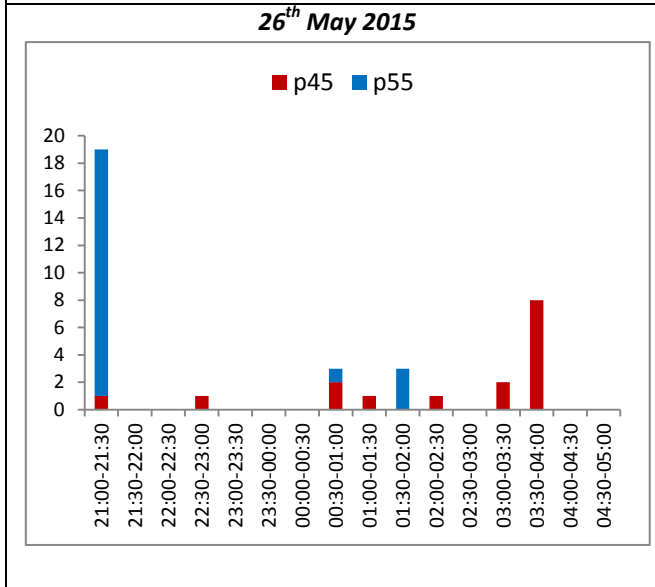
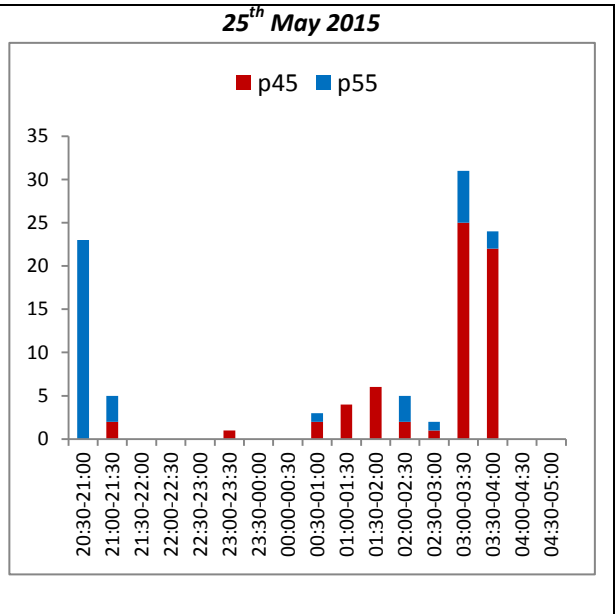
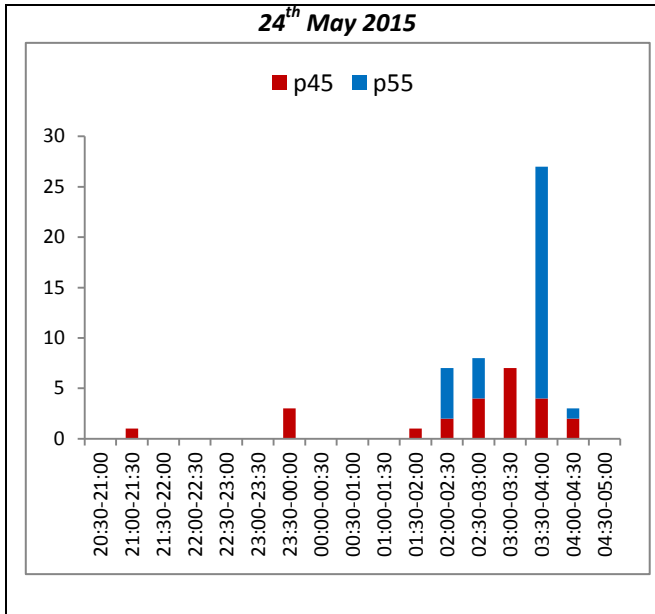
**Static Detector D1: North-west corner of Area D1 TQ 35564 74380**





**Static Detector D2 – Interior of the woodland TQ35616 74306**



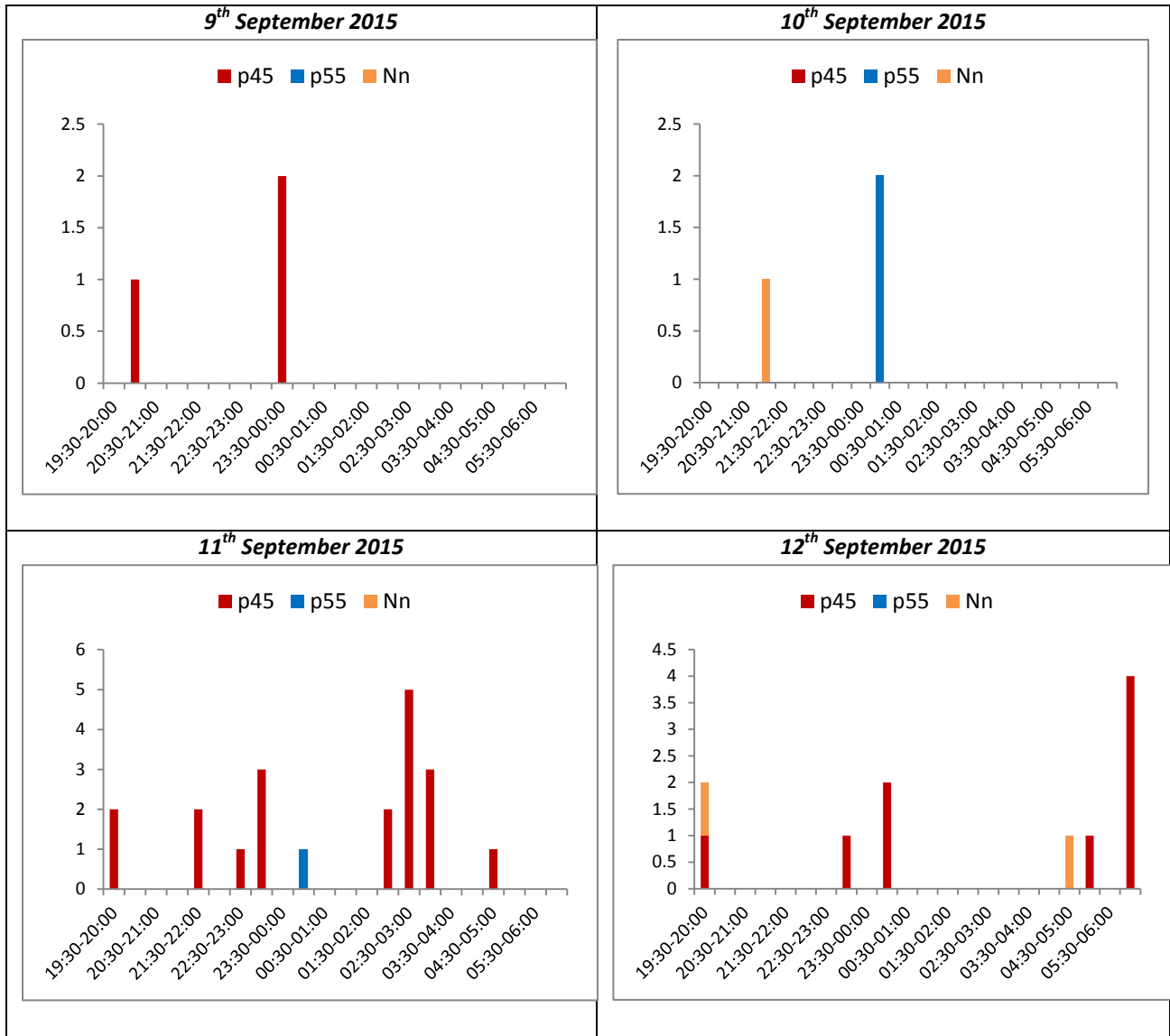


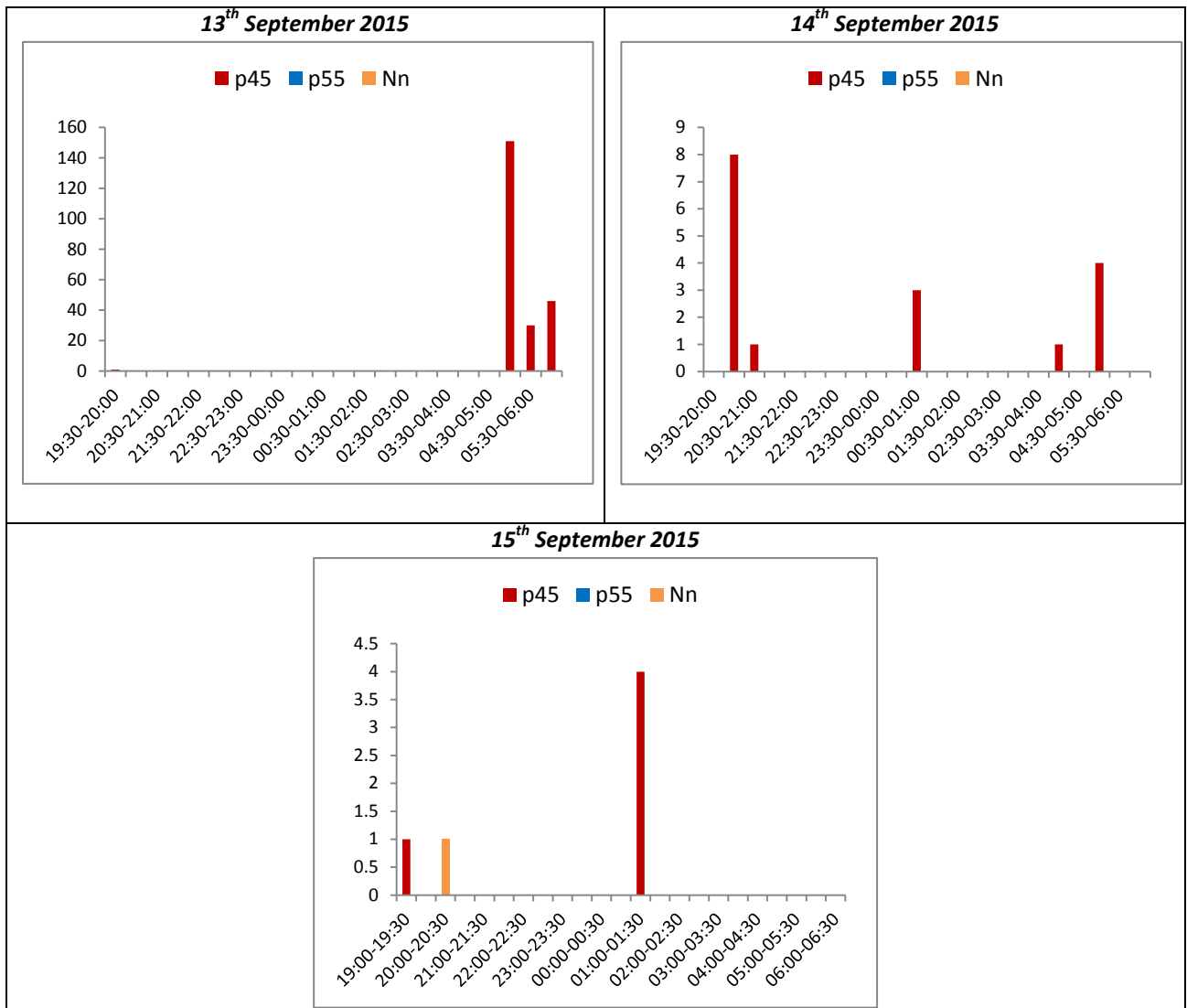
**Static detector survey 8<sup>th</sup> to 15<sup>th</sup> September 2015**

*Weather conditions (Data from weatheronline.co.uk)*

Date	Minimum temperature (°C)	Total rainfall (mm)	Sunrise	Sunset
08/09/15	10	0	19:31	06:24
09/09/15	12.5	2	19:29	06:25
10/09/15	11.75	2	19:27	06:27
11/09/15	11.75	0.25	19:24	06:28
12/09/15	15	0.25	19:22	06:30
13/09/15	10	0	19:20	06:32
14/09/15	12	11	19:17	06:33
15/09/15	10.25	0.5	19:15	06:35

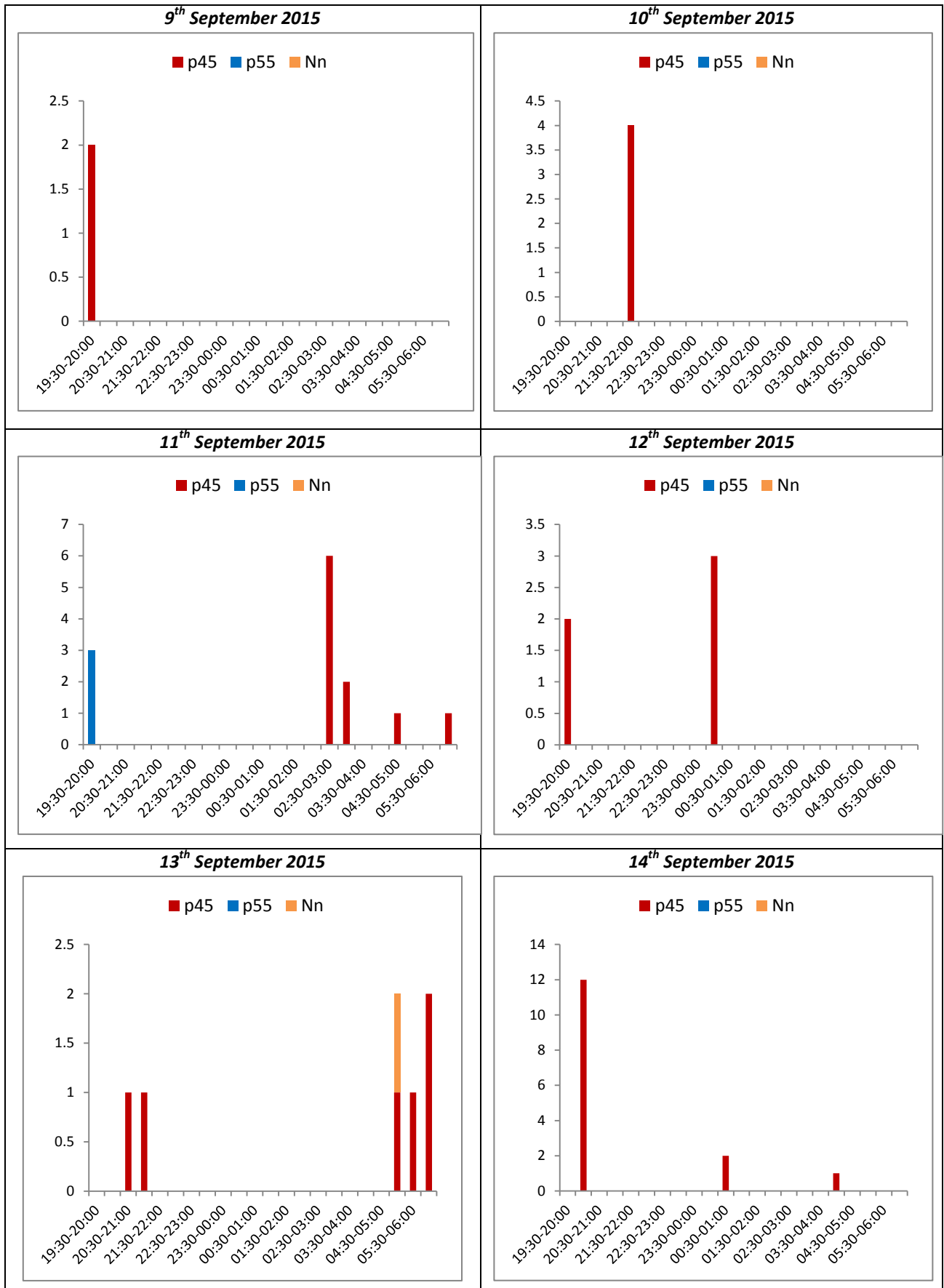
**Static Detector D3 – Interior of the woodland TQ35608 74298**



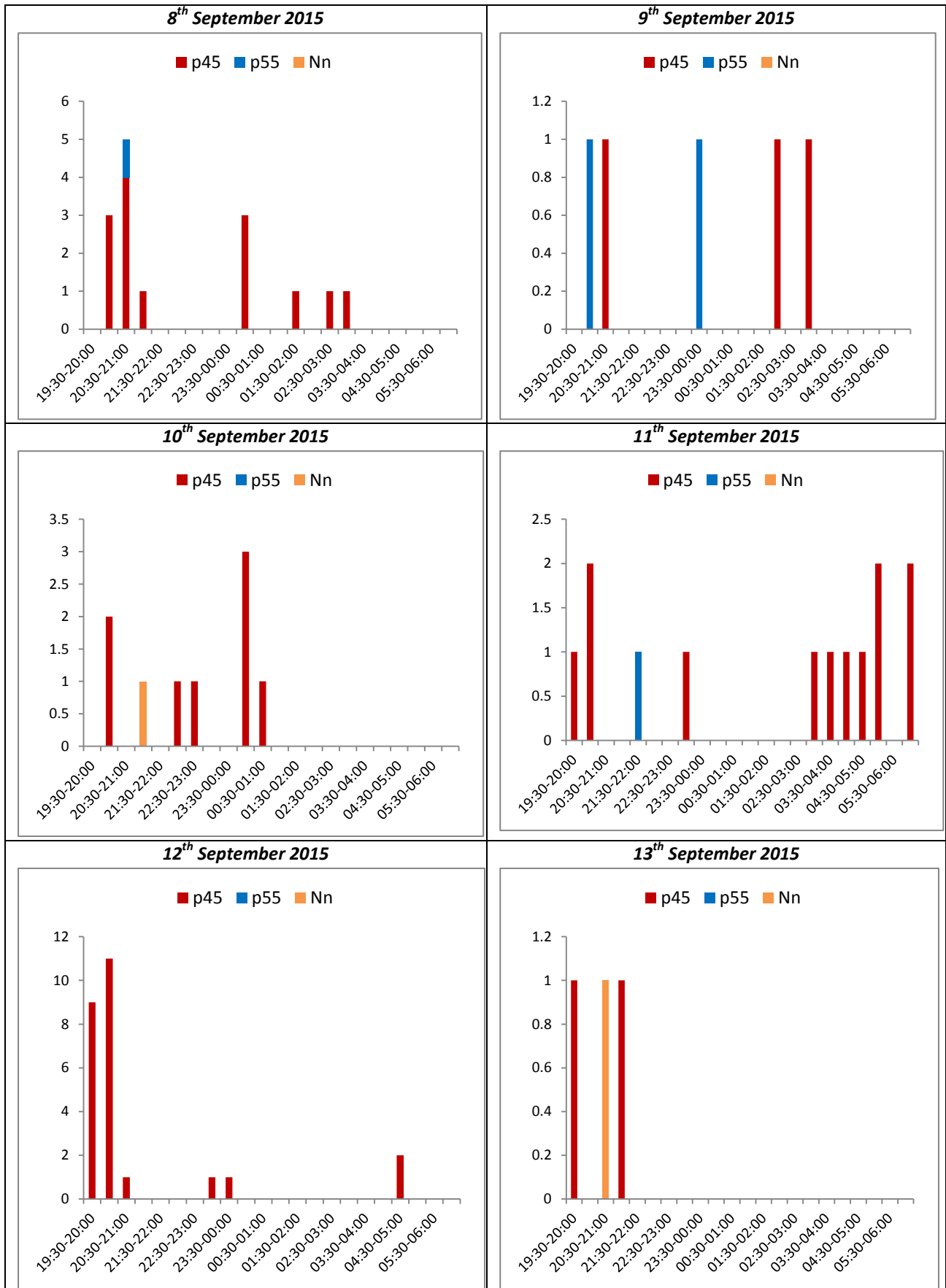


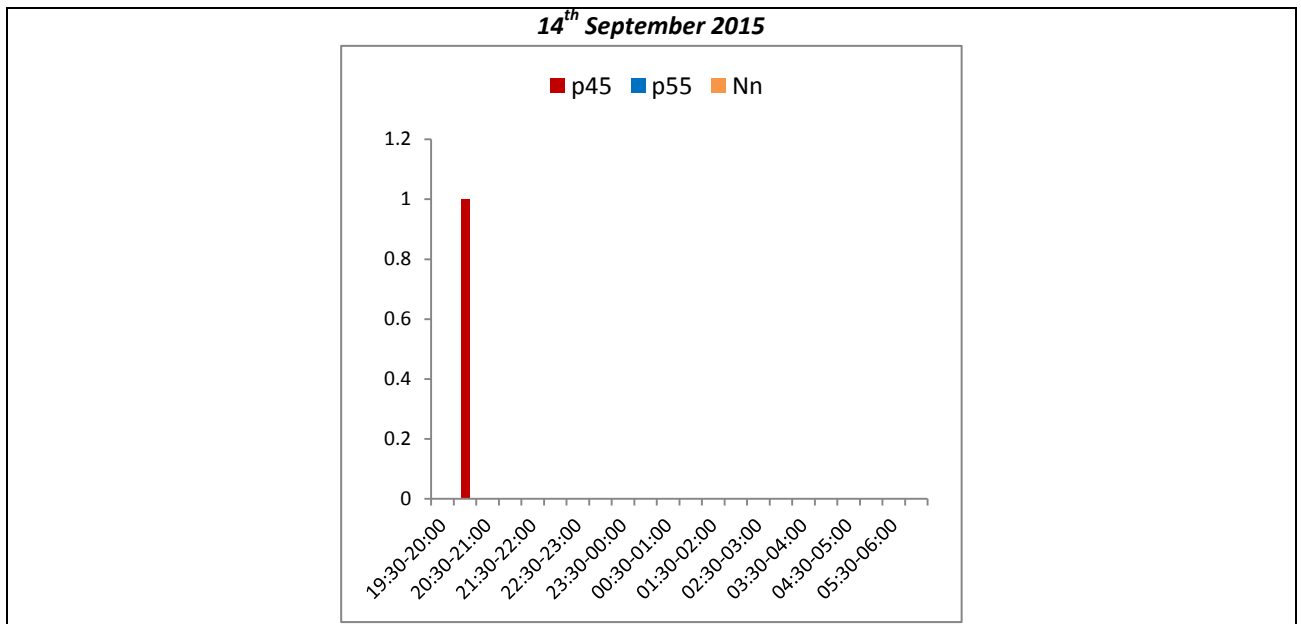


**Static Detector D4 – Interior of the woodland TQ35593 74307**



**Static Detector D5 – Interior of the woodland TQ35596 74309**





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Camberwell Old Cemetery, London  
Borough of Southwark SE22 0PG

Bat Survey Report

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Prepared by: Huma Pearce BSc MSc MCIEEM  
(Class 2 licence; Registration No. 2015-10493-CLS-CLS)

Date: September 2015

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## EXECUTIVE SUMMARY

Planning permission (15/AP/3184 & 15/AP/3185) is being sought for remediation and landscaping works at Area Z and the western boundary of Camberwell Old Cemetery in the London Borough of Southwark SE22 0PG. Southwark Council commissioned bat surveys to evaluate the value of the area for bats and the likely impacts of the proposals on these European Protected Species.

The key findings of these surveys were:

- The London Bat Group data search revealed 27 summer roosts, two hibernation roosts and flight records for common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P.pygmaeus*, Nathusius' pipistrelle *P.nathusii*, noctule *Nyctalus noctula*, Leisler's bat *N. Leisleri*, serotine *Eptesicus serotinus*, brown long-eared bat *Plecotus auritus* and Daubenton's bat *Myotis daubentonii* within 2km's of the site.
- Of the 21 mature trees that would be removed, two have HIGH roost potential (T177 & T147), four have MEDIUM roost potential (T11\*, T155, T158 and T183) and eleven have LOW roost potential.
- Good numbers of common pipistrelle and soprano pipistrelle bats were recorded at Area Z. Both species were noted during the emergence period. Low levels of activity by Leisler's bat, serotine, noctule, *Myotis* species and long-eared bat were also recorded.
- There is a HIGH and MEDIUM risk that transient roosts used by low numbers of common pipistrelle and soprano pipistrelle bats occur at the site, respectively.
- Area Z offers a good foraging resource for common pipistrelle and soprano pipistrelle bats. The site also provides suitable habitat for low numbers of *Myotis* species and long-eared bats.
- Area Z falls within a flight line used by low numbers of commuting common pipistrelle, soprano pipistrelle noctule, Leisler's bat and serotine bats.

The loss of a transient roost(s) used by single or low numbers of pipistrelle bats would have a LOW impact on the local bat population. Tree works must follow an appropriate mitigation strategy to ensure compliance with the wildlife legislation, to include:

- Any trees not included in the Preliminary Bat Assessment will need to be surveyed by a suitably qualified ecologist prior to their removal (T11\*, T155, T158, T179a, T181, T58\*, T195, T183, T41\* and T44a).
- Tree and vegetation clearance works should ideally be undertaken between mid September and the end of October which is outside of the bat hibernation period and bird nesting season.
- Any trees identified as having HIGH or MEDIUM roost potential should be climbed or accessed using a MEWP and all suitable roost features inspected by a Class 2 bat ecologist using an endoscope immediately prior to their removal. A search for nesting birds must also be carried out.

- Works can only proceed if no evidence of a bat roost or active nest is discovered. If a roost is discovered, works can only be legally carried out under licence from Natural England. If nesting birds are discovered, works within a 5m radius of the nest must be postponed until the young have fledged.

Bat boxes (No.8) and bird nest boxes (No.11) will be installed within the Underhill Road and Ryedale Road Nature Conservation Buffer Area, which will compensate for any loss of roost/nest sites arising from vegetation clearance activities. The installation of an additional 2 bat boxes (e.g. 2FN and/or 2F) on tree T175 or T187, which are in the vicinity of a common pipistrelle roost, is recommended. Bat and bird boxes would need to be checked annually by a suitably qualified ecologist to ensure the long-term value of these features. The trees would also need to be appropriately managed in order to ensure that clear entry paths to the boxes are maintained.

Proposals to plant native tree and shrub species/hedgerows and the laying of wildflower turf/flowering lawn mixtures with meadow fringes will enhance the biodiversity value of the site in the long-term and compensate for the loss of the existing bat foraging resource. The overall impact of the works on foraging bats is therefore assessed as NEGLIGIBLE.

The impact of the landscaping proposals on commuting bats is assessed as NEGLIGIBLE since new linear habitat features (native hedgerows and tree lines) are included in the landscape designs.



## 1. INTRODUCTION

### 1.1 BACKGROUND

- 1.1.1 Planning permission is being sought for remediation and landscaping works within Area Z at Camberwell Old Cemetery in the London Borough of Southwark SE22 OPG (15/AP/3185). The installation of new fencing is also planned along the full extent of the western boundary, to include a new pedestrian entrance on Underhill Road (15/AP/3184).
- 1.1.2 Bat surveys were commissioned by Southwark Council in summer 2015 to assess the value of the site for bats and the potential impacts of the proposals on these European Protected Species (refer to Appendix A1 for wildlife legislation). This reports details the findings of the surveys and provides an assessment of the impact of the proposals on bats. Mitigation measures required to comply with the wildlife legislation are also provided.

### 1.2 DESCRIPTION OF SITE

- 1.2.1 Camberwell Old Cemetery is situated on the western side of Forest Hill Road in the London Borough of Southwark, SE22 OPG. The National Grid Reference for the centre of the cemetery is TQ348741. The cemetery dates back to the 1850's and is approximately 12 hectares (ha) in size.
- 1.2.2 The northern, western and southern boundaries are demarcated by Ryedale Road (north), Underhill Road (west), and Langton Rise and Wood Vale (south). The boundary of the cemetery is fenced or walled with access provided along Forest Hill Road (east) and at the corner of Langdon Rise and Wood Vale (south-west).
- 1.2.3 The southern part of the site is occupied by frequently mown grassland (with burial plots) and mature scattered trees. Dense stands of mature trees have developed into secondary woodland habitat with an understory of brambles and tall herbs, in the northern part of the cemetery (see Appendix A2, Plan 1).
- 1.2.4 Camberwell Old Cemetery is situated in an urbanised area of south-east London and the surrounding land use is dominated by residential properties and small scale commercial premises. There are several areas of open space within the surrounding landscape (see Table 1 below) and these sites support a diversity of habitats including secondary and ancient woodland, meadows, acid, neutral and amenity grassland, ornamental planting, scrub, scattered mature trees, veteran trees and open water habitats. Connectivity between the cemetery and these sites is provided by private gardens, mature tree lines and the tree-lined Southern Railway and London Overground railway sidings.
- 1.2.5 Camberwell Old Cemetery is designated a Site of Borough Grade I Importance for Nature Conservation. Notable habitats for which the site was designated include grassland, mature trees, scrub and black poplars.

- 1.2.6 Other statutory and non-statutory sites that occur within 2km's of the Cemetery are listed in Table 1. These include: three Local Nature Reserves (LNR), (the nearest is One Tree Hill LNR, 565m east of the site); five Borough Grade I; and, three Borough Grade II Sites of Importance for Nature Conservation.
- 1.2.7 Metropolitan sites are of regional importance (to the whole of Greater London) and Borough Grade I and II sites are important in a borough-wide context.

**Table 1: Areas of open space within 2km of the site**

Site	Habitat	Distance and orientation
<b>Local Nature Reserves</b>		
One Tree Hill	Secondary woodland, Acid grassland, Common lizard, Stag beetle, Owls.	565m, E
Sydenham Hill Wood and Fern Bank	Ancient woodland, Ponds, Veteran trees, Dead wood, Owls, Hobby, Kestrel, Sparrow hawk, Bats.	1.3km S
Nunhead Cemetery	Secondary woodland, Grassland, Tawny owl, Greater spotted woodpecker.	1.4km NE
<b>Sites of Metropolitan Importance</b>		
Nunhead Cemetery	As above	
Dulwich and Sydenham Hill Wood	As above	
Forest Hill to New Cross Gate Railway Cutting	Woodland, Acid & Neutral grassland, Reed bed, Scrub.	1.4km, SE
<b>Sites of Borough Grade I Importance</b>		
One Tree Hill		
Dulwich and Sydenham Hill Golf Course	Woodland, Pond, Oak pollards, Scrub, Acid grassland.	1.2km SW
Peckham Rye Park and Common	Standing & running water, Veteran trees, Woodland, Parkland, Wildflower meadows, Stag beetle, Watercress, Water figwort, Lamprey, Kingfisher, Bats, House sparrow.	410m N
Dulwich Park	Standing water, Parkland, Waterfowl, Bats, Veteran trees, Stag beetle, Woodland birds.	910m, SW
Centre for Wildlife Gardening	Ponds, Wildflower plots, Meadow, Common frog, Smooth newt, Stag beetle.	1.6km, NW
<b>Sites of Borough Grade II Importance for Nature Conservation</b>		
Camberwell New Cemetery, Honor Oak Crematorium, Sports ground.	Secondary woodland, Hedges, Mature trees, Common lizard.	850m, E
Belair Park	Standing water, Wet woodland, Veteran trees, gypsywort, lesser pond-sedge, Waterfowl. Bats, stag beetle.	1.95km, SW
Brenchley Gardens	Woodland, Grassland, Pollarded ash, cowslip, Stag beetle.	1.1km, NE
<b>Registered Park and Garden Grade II</b>		
Horniman Gardens		780m, S

### 1.3 AREA OF THE PROPOSED WORKS

- 1.3.1 Remediation and remodelling work are planned within Area Z which is located in the north-western part of Camberwell Old Cemetery (TQ346741) (see Appendix A2, Plan 2). The area that will be impacted by the works is approximately 1ha in size. This part of the site is fenced off, currently unmanaged and not open to the public.

- 1.3.2 Area Z supports species poor grassland (at the centre of the survey area) that has become encroached by bramble, butterfly bush and tall herbs dominated by cow parsley and common hogweed. Scattered mature trees dominated by sycamore with frequent ash, occasional oak and lower numbers of horse chestnut, Norway maple and *Salix* sp. occur throughout the site but with a greater number of mature trees found at the boundary.
- 1.3.3 The western boundary, where new fencing will be installed and a new pedestrian access provided (Appendix A2, Plan 3), currently supports mature trees dominated by sycamore together with oak, horse chestnut, lime and poplars.

## 1.4 PROPOSALS

- 1.4.1 Planning permission is being sought for:
- (1) The replacement of boundary fencing along Underhill Road and the creation of a new pedestrian entrance on Underhill Road (15/AP3184) (see Appendix A2, Plan 3).
  - (2) Remediation and remodelling of part of the cemetery close to Underhill Road (Area Z) to include drainage works, the laying of new access paths and associated landscaping (15/AP/3185) (see Appendix A2, Plan 5).
- 1.4.2 The majority of mature trees and shrub vegetation that occurs at the boundary with Ryedale and Underhill Road will be retained.
- 1.4.3 The remediation and landscaping works proposed within Area Z are shown in Appendix A2, Plan 5. Works will include:
- The removal of no less than 20 mature trees;
  - The removal of fly-tipped materials to make the site safe for public use;
  - The creation of new pathways to provide safe access to the site;
  - Topographical and drainage works;
  - The treatment and removal of invasive species Japanese knotweed;
  - New planting with native trees and shrubs and native hedgerows;
  - The laying of wildflower rich turf with meadow fringes; and,
  - The creation of a designated conservation area in the northern part of the site and along the western boundary to include biodiversity enhancements (e.g. bat boxes (No.8), bird boxes (No.11), log piles (No.6) and above ground reptile hibernaculum).

## **1.5 THE ECOLOGICAL SURVEY**

- 1.5.1 The ecological assessment comprised: a desktop study, daytime habitat assessment, a ground level inspection of trees identified for removal, two evening bat emergence and activity surveys and longer-term monitoring of bat activity at notable habitat features using static un-manned detectors.
- 1.5.2 The surveys were completed by a Class 2 Natural England Bat Licensee (Registration No. 2015-10493-CLS-CLS) and followed the methodology outlined in the Bat Conservation Trust (2012) Bat Surveys – Good Practice Guidelines.

## **1.6 LIMITATIONS**

- 1.6.1 The arboricultural report was not available for the Preliminary Bat Assessment and it was difficult to accurately determine which trees were planned for removal from the plans provided (see Appendix A2, Plan 4). The arboricultural report recommends an additional five trees for removal (T181, T58\*, T155, T158 and T183) which were not surveyed during the Preliminary Bat Assessment. Roost potential was instead inferred from information provided within the arboricultural survey report (Harrison Design Development).
- 1.6.2 The design plans were significantly modified between the April/May 2015 and September 2015 surveys. Most notable was the omission of works within the northernmost part of the site to provide the Underhill Road and Ryedale Road Nature Conservation Buffer Area. Early bat records during the emergence period were noted in this part of Area Z during the May 2015 surveys which was suggestive of a roost(s) site. Further investigations were therefore warranted during the September 2015 survey.
- 1.6.3 The new design plans include the removal of an additional ten trees which were not surveyed during the Preliminary Bat Assessment. By September 2015 the site was significantly overgrown with impenetrable bramble scrub and the trees were in full leaf. The value of these trees to roosting bats was therefore inferred from information in the arboricultural report and from field observations made during the September emergence and activity survey. These trees may require survey prior to their removal.
- 1.6.4 There were periods of heavy rain during the static detector surveys, which will affect bat activity such as later emergence times and reduced activity.
- 1.6.5 The site was very overgrown with brambles, particularly by September, which made access around the site difficult. Furthermore, many trees were heavily clad with ivy and together with the height of the surrounding vegetation, the views of potential roost features was significantly obscured making it difficult to pinpoint the origin of bat emergence.

## **2. METHODOLOGY**

### **2.1 DESK STUDY**

- 2.1.1 A data search of all known bat records within a 4 x 4km square centred on Area Z was requested from the London Bat Group in April 2015. The purpose of the study was to determine whether there was any historical evidence of a roost within or near to the site and to ascertain the species of bat known to be present within the immediate surrounding area.

### **2.2 PRELIMINARY BAT ASSESSMENT**

- 2.2.1 A daytime survey of the application site was carried out on the 30<sup>th</sup> April 2015.
- 2.2.2 A ground level inspection of all mature trees (No.18) identified for removal within the original proposal plan (Plan 4, Appendix A2) was completed to assess their value to bats as a roost. Features such as natural holes, cracks/splits in major limbs, loose bark, the presence of dense epicormic growth and/or ivy, were identified. Bat field signs, notably droppings, scratch marks and urine and fur oil staining around suitable crevices were also search for. The survey was carried out using close focusing binoculars and a high power torch. The assessment was based on methodology outlined in the Bat Conservation Trust Bat Survey Guidelines (2012) and Andrew Cowan, ArborEcology, 2003.
- 2.2.3 The suitability of the site and immediate surrounding area to provide foraging and commuting opportunities for bats was assessed based on observations during the site assessment, from aerial photographs (Google Earth) and direct observations during the evening bat emergence and activity surveys (see Section 2.3 below). The value of the habitat to foraging bats was assessed according to the occurrence of vegetation that typically supports high insect biomass such as edge and mosaic habitats, sheltered habitat features, broadleaved trees and aquatic habitats. Aerial photographs were used to determine connectivity of the site to the surrounding area.

### **2.3 BAT EMERGENCE AND ACTIVITY SURVEY**

- 2.3.1 Two evening bat emergence and activity surveys were carried out at the site on 11<sup>th</sup> May 2015 and 3<sup>rd</sup> September 2015 by three surveyors. The surveys commenced at 15 minutes before sunset and lasted for two hours.
- 2.3.2 Surveyors were equipped with Bat Box Duet Heterodyne and Frequency Division bat detectors and hand held recording devices and/or EM3+ detectors with in-built recording capabilities (Acoustic Monitoring Inc). Surveyors were located near to trees found to support features of HIGH and MEDIUM roost potential, to monitor any bat emergence. One unmanned (EM3+) detector was also placed in the clearing in the southern part of the site during the May survey to monitor bat foraging and commuting activity. A transect was walked by one surveyor during the September survey to obtain wider information on the

use of site by bats. (The location of surveyors and unmanned detectors is shown in Appendix A4, Plans 7 & 8)

- 2.3.3 All bat calls were recorded and later analysed using Bat Sound (Petterssen Elektronik; Bat Sound 4.1) and Analoow (Titley Electronics; Version 4.1) software to verify the species. Bat activity observed during the survey was mapped.

## **2.4 STATIC DETECTOR SURVEYS**

- 2.4.1 Four and three automated static detectors (SongMeter2; Acoustic Monitoring and Anabat SD1; Titley Electronics) were deployed at Area Z between 30<sup>th</sup> April and 11<sup>th</sup> May and 3<sup>rd</sup> to 8<sup>th</sup> September 2015 respectively, to monitor bat activity at the site and further assess the likelihood of roost sites occurring within the survey area. The location of the static detectors is shown in Appendix A5, Plan 9.
- 2.4.2 The detectors were programmed to be active between sunset–30 minutes and sunrise+30 minutes. All bat contacts were recorded and later analysed using Bat Sound (Petterssen Elektronik; Bat Sound 4.1) and Analoow (Titley Electronics; Version 4.1) software to verify the species.

### ***May 2015***

- 2.4.3 Four locations within Area Z were surveyed during May 2015. Detectors 1 and 2 were deployed in the south-east corner (by T185, T186 and T195) and north-east part of the site (by T177, T176, T175, T187, T188 and T189) respectively between 30<sup>th</sup> April and 8<sup>th</sup> May 2015. Detectors 3 and 4 were deployed in the north-west (between T162, T161 and T160) and south-west (by T139 and T140) parts of the site respectively, between 8<sup>th</sup> and 11<sup>th</sup> May 2015.

### ***September 2015***

- 2.4.4 Three static detectors were deployed within Area Z between the 3<sup>rd</sup> and 8<sup>th</sup> September 2015. One detector (D5) was stationed in the north-east corner of the site near to T177, T176, T187, T188 and T189. A second detector (D6) was located along the western boundary in front of T147, which supports features of HIGH roost potential. The third detector (D7) was located towards the centre of the site, in an area of grassland surrounded by bramble and butterfly bush shrub, to monitor foraging and commuting activity.

### 3. RESULTS

#### 3.1 DESK STUDY

- 3.1.1 Twenty-seven summer roosts for: unconfirmed *Pipistrellus sp.* (No.6), common pipistrelle *P. pipistrellus* (No.1), soprano pipistrelle *P. pygmaeus* (No. 8), noctule *Nyctalus noctula* (No. 1), Leisler's bat *N. Leislerii* (No.6), brown long-eared bat *Plecotus auritus* (No.2) and unidentified vesper bat Vespertilionidae (No.3); were returned from the data search. Twenty-three of the summer roosts and two hibernation roosts (for common pipistrelle and brown long-eared bat) were noted from Sydenham Hill Woods which is 1.7km south of the site. The nearest known roost was for *Pipistrellus* species 1.2km south of the cemetery.
- 3.1.2 Two bat casualty records for soprano pipistrelle and unidentified vesper bat, which are often indicative of a roost occurring nearby, were also noted. The nearest record was 1.4km from the site.
- 3.1.3 Flight records for common pipistrelle (No.147), soprano pipistrelle *P. pygmaeus* (No. 66), Nathusius' pipistrelle (No.2), unidentified *Pipistrellus* species (No. 29), noctule *Nyctalus noctula* (No.31), Leisler's bat *N. leislerii* (No. 12), serotine (No. 5), Daubenton's bat *Myotis daubentonii* (No.9) and unidentified vesper bats (No. 11) were revealed from the data search. The nearest records were 300m from the site and included common pipistrelle and soprano pipistrelle bats.

#### 3.2 PRELIMINARY BAT ASSESSMENT

- 3.2.1 A Preliminary Bat Assessment (ground level tree assessment and habitat assessment) was completed on 30<sup>th</sup> April 2015. The weather conditions during the survey were dry with sunny intervals and an average temperature of 15°C.

##### ***Ground level tree assessment***

- 3.2.2 The eighteen trees, proposed for removal within the original landscaping plans (see Appendix A2, Plan 4), were surveyed. Features that offered potential value to bats as a roost site are described in Appendix A3. Photographs are also provided to support the descriptive text. Trees were classified as having HIGH, MEDIUM, LOW or NEGLIGIBLE roost potential according to the extent of suitable roost features present.
- 3.2.3 The landscaping plans were modified following the completion of the Preliminary Bat Assessment with seven trees now retained and a further ten trees highlighted for removal. New trees proposed for removal were not included within the Preliminary Bat Assessment and instead their roost potential was inferred from information provided within the arboricultural survey and observations made during the September evening bat emergence and activity survey.
- 3.2.4 A plan showing the results of the tree assessment is provided in Appendix A3, Plan 6.
- 3.2.5 Two trees; sycamore T177 and Norway maple T147; were classified as having HIGH bat roost potential.

Ringed necked parakeets were nesting in the cavities of T177 in May 2015 and the likelihood of bats roosting within this tree during the early part of the activity season was considered NEGLIGIBLE. However, the parakeets had left their nest sites by September and these features were considered to be of HIGH potential value to bats as a roost site during the later part of the activity season.

- 3.2.6 Two trees; Sycamore T187 and Sycamore T182; were classified as having MEDIUM bat roost potential. Potential roost habitat included shallow cavities, boss holes, callus growth (which may be associated with cavity features) and dense ivy cover which created sheltered crevice features of value to low numbers of bats. These trees are no longer scheduled for removal within the revised landscaping plans.
- 3.2.7 Salix T11\*, horse chestnut T155, sycamore T158 and 'other broadleaved' T193 were not included in the Preliminary Bat Assessment but based on information provided in the arboricultural report, they are assessed as having MEDIUM roost potential.
- 3.2.8 Eleven trees scheduled for removal support LOW value roost features. Roost habitat was mostly associated with dense ivy cover which was a common feature throughout the survey area.
- 3.2.9 Four trees (T178, T44a, 179a and T41\*) were not found to support suitable roost features and their value to bats was assessed as NEGLIGIBLE.

#### ***Foraging habitat***

- 3.2.10 Mature oaks, ivy clad sycamores and the dense understory of bramble scrub and tall herbs offered suitable habitat for invertebrates and the site was assessed as offering suitable bat foraging opportunities.

#### ***Commuting habitat***

- 3.2.11 Trees that occurred at the boundary of the site offer a potential flight line for commuting bats as well as suitable foraging habitat and screening of light spill from the adjacent street lighting on Underhill Road and Ryedale Road.
- 3.2.12 Although the surrounding land use is heavily urbanized, there are several areas of open space that occur within 2km of Camberwell Old Cemetery, notably Camberwell New Cemetery, Peckham Rye Park, Sydenham Hill Wood, Dulwich Wood, Dulwich Park, Horniman Museum and Gardens, and Dulwich and Sydenham Golf Course. Many of these sites were confirmed to provide suitable habitat for bats (from the London Bat Group data search), and connectivity between the cemetery site and these habitats is provided by the Southern Railway and London Overground railway sidings and private gardens.

### **3.3 EVENING BAT EMERGENCE AND ACTIVITY SURVEY**

- 3.3.1 Full details of the evening bat emergence and activity surveys are provided in Appendix A4. This includes details on the weather conditions, a timeline of all bat contacts and maps of bat activity observed during



the surveys (Plans 7 & 8).

- 3.3.2 Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, serotine *Eptesicus serotinus*, Leisler's bat *Nyctalus leislerii*, *Myotis* species (possible Natterer's bat *Myotis nattereri*) and a single long-eared bat were noted during the surveys.

#### **Roost sites**

- 3.3.3 No bats were confirmed to emerge from any of the trees within Area Z but common pipistrelle were noted at 8 and 6 minutes before sunset during the September survey and soprano pipistrelle bats were recorded at 5 and 9 after sunset during the May survey which suggests that roost sites for these species likely occur within or immediately adjacent to the survey area.
- 3.3.4 The majority of early common pipistrelle records were picked up near to the trees T177, T176, T187, T188 and T189 in the north-eastern part of the site. Based on the number of observations and the time of year when early records were reported, any roosts occurring in this part of the site are likely to be used by a single or low numbers of bats (e.g. ≤ 3bats).
- 3.3.5 Several common pipistrelle bats were also seen to pass into the site from the north-east during both the May and September surveys and it is likely that a common pipistrelle roost (possibly a maternity colony) occurs within one or more of the properties on Ryedale Road.
- 3.3.6 Early records for soprano pipistrelle bats noted during the May survey were associated with observations of bats passing into the site from the west. A roost site for this species is therefore likely within one of the properties on Underhill Road rather than within the site itself.
- 3.3.7 Serotine, Leisler's bat and long-eared bat were noted late in their typical emergence period and it is unlikely that roosts for these species occur within the survey area.

#### **Foraging habitat**

- 3.3.8 The site was found to offer a good foraging resource for common pipistrelle and soprano pipistrelle bats. Foraging activity by common pipistrelle bats was almost continuous throughout the surveys, with the highest levels of activity recorded in the northern part of the site. Notable habitat features used by foraging bats included the tree canopy (particularly the canopy of oaks), ivy clad trees, bramble scrub and transitional habitat which comprised trees, scrub and open grassland habitat.
- 3.3.9 Records for *Myotis* species and long-eared bat suggest that the site also offers suitable habitat for these species.

#### **Commuting habitat**

- 3.3.10 Common pipistrelle and serotine were seen to commute into and over the site from the north/north-east and common pipistrelle, soprano pipistrelle and long-eared bat were seen to commute into the site from

the west. These findings confirm that the site falls along a bat flight line used by low numbers of bats.

### 3.4 STATIC DETECTOR SURVEYS

- 3.4.1 Bat activity within Area Z was monitored using static detectors during May (4 locations) and September (3 locations) for between three and seven nights. The location of the detectors is shown in Appendix A5, Plan 9. The results of the surveys are summarised in Appendix A5 (the total number of bat contacts for each species recorded over 30 minute durations throughout the surveys) together with information on sunrise/sunset times and the weather conditions (minimum temperature and rainfall) during the surveys.

#### **May 2015**

- 3.4.2 Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus* and serotine *Eptesicus serotinus* calls were picked up by the detectors. Common pipistrelle bats were recorded most often.
- 3.4.3 Common pipistrelle and soprano pipistrelle bats were recorded during the emergence period (see Tables 2-5 below). The earliest common pipistrelle record was at 12 minutes after sunset from D4, in the south-west corner of the site. The earliest soprano pipistrelle contact was at 8 minutes after sunset from D4 in the north-west corner of the site. These records suggest that bat roosts occur within or near to the site.
- 3.4.4 Feeding activity by common pipistrelle and soprano pipistrelle bats were noted throughout the nights, particularly in the northern part of the site where there was good canopy cover and an understorey of dense bramble scrub. These findings confirm that the site offers a good foraging resource for these species.
- 3.4.5 Records for common pipistrelle, soprano pipistrelle and serotine bats later in the emergence period confirm that the site falls along a flight line used by these species.

**Table 2: The time of the first and last bat records noted by static detector D1 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
30/04/15	N/A	N/A	N/A	N/A
01/05/15	+26	N/A	N/A	N/A
02/05/15	+19	N/A	N/A	N/A
03/05/15	+18	N/A	N/A	N/A
04/05/15	N/A	N/A	N/A	N/A
05/05/15	+29	N/A	N/A	N/A
06/05/15	N/A	N/A	N/A	N/A
07/05/15	N/A	N/A	N/A	N/A

**Table 3: The time of the first and last bat records noted by static detector D2 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
30/04/15	N/A	+28	N/A	N/A
01/05/15	N/A	N/A	N/A	N/A
02/05/15	N/A	N/A	N/A	N/A
03/05/15	+23	N/A	N/A	N/A
04/05/15	+17	N/A	N/A	N/A
05/05/15	+19	N/A	N/A	N/A
06/05/15	+26	N/A	N/A	N/A
07/05/15	+21	+29	-21	N/A

**Table 4: The time of the first and last bat records noted by static detector D3 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
08/05/15	+16	+8	-30	N/A
09/05/15	+15	N/A	-20	-45
10/05/15	+26	N/A	-27	N/A

**Table 5: The time of the first and last bat records noted by static detector D4 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
08/05/15	+12	+25	-18	N/A
09/05/15	+21	+29	-33	N/A
10/05/15	+27	+23	-26	N/A

**September 2015**

- 3.4.6 Common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula* and a single record of a *Myotis* species were recorded during the survey. Again, common pipistrelle were recorded most often and both common pipistrelle and soprano pipistrelle bats were recorded during the emergence period.
- 3.4.7 Common pipistrelle were noted at between -7 and + 20 minutes after sunset and between 20 and 30 minutes before dawn by the detector located in the north-east corner of the site (D5) (see Table 6, below). These records confirm that a roost site likely occurs within the immediate vicinity.
- 3.4.8 Common pipistrelles were also noted at 8 minutes after sunset and at 21 minutes before sunrise along

the western boundary (D6) on the night of the 3<sup>rd</sup> September 2015 (see Table 7, below). It is possible that a transient roost occurs within one of the trees nearby.

- 3.4.9 Records for soprano pipistrelle later in the emergence period (17-22 minutes before sunset) suggest that a roost site occurs near to the western boundary, possibly within one of the properties located on Underhill Road.
- 3.4.10 High levels of social calls by common pipistrelle and soprano pipistrelle were noted during the September survey which is an indicator of competition for resources as well as mating behaviour. The occurrence of mating roost sites is therefore considered likely within the survey area.
- 3.4.11 High levels of foraging activity by pipistrelle bats noted by D5 and D6 offers further support for the value of the site for these species.
- 3.4.12 Noctule were noted by the detector at the centre of the site and along the western boundary. The earliest record was at 25 minutes after sunset and the likelihood of a roost occurring at the site is considered low. Instead the survey area is likely to fall along a flight line used by commuting noctule.
- 3.4.13 A single record for a *Myotis* species was picked up by the detector at the centre of the site (D7). This record together with data collected during the September evening bat emergence and activity survey suggests that the site offers suitable foraging and commuting habitat for low numbers of *Myotis* bats.
- 3.4.14 Records for common pipistrelle, soprano pipistrelle bats and noctule later in the emergence period confirm that the site falls within a flight line used by these species.

**Table 6: The time of the first and last bat records noted by static detector D5 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
03/09/15	-5	+16	-20	-17
04/09/15	+6	+16	-21	-30
05/09/15	+15	+23	-31	N/A
06/09/15	+20	+20	-28	-34
07/09/15	-7	+23	-27	-21

**Table 7: The time of the first and last bat records noted by static detector D6 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
03/09/15	+8	N/A	-37	N/A
04/09/15	+7	N/A	-21	N/A
05/09/15	+17	N/A	N/A	N/A
06/09/15	+21	+25	-27	N/A
07/09/15	+22	+26	N/A	N/A

**Table 8: The time of the first and last bat records noted by static detector D7 during the emergence and re-entry periods respectively**

Date	Minutes after sunset (emergence period)		Minutes before sunrise (re-entry period)	
	p45	p55	p45	p55
03/09/15	+10	+30	-22	N/A
04/09/15	+17	N/A	-18	N/A
05/09/15	N/A	N/A	N/A	N/A
06/09/15	N/A	+28	-34	N/A
07/09/15	+25	N/A	N/A	N/A

***Variations between the May and September surveys***

- 3.4.15 A lower number of bat records were obtained during the May surveys compared to the September surveys. This is likely due to the weather conditions whereby minimum temperatures fell below the recommended 8°C on three nights and rain was reported on five nights during the May survey.

## 4. CONCLUSIONS

### 4.1 ROOST SITES

- 4.1.1 The likelihood of a common pipistrelle roost occurring within the survey area is HIGH. The risk of a maternity roosts being present is NEGLIGIBLE. Instead roost sites are likely to be transient and used by single or low numbers of bats, particularly during the later part of the activity season. At a population level, the significance of these roost sites is assessed as LOW.
- 4.1.2 The likelihood of soprano pipistrelle roosts occurring within the survey area is LOW. Soprano pipistrelle arrived on site from the west and roosts may occur within one or more of the properties located on Underhill Road, rather than within the survey area itself.
- 4.1.3 The high numbers of social calls noted by common pipistrelle and soprano pipistrelle bats during the September survey provides evidence for the possibility that mating roosts within the survey area.
- 4.1.4 Only low numbers of noctule, Leisler's bat, serotine, *Myotis* species and long-eared bats were noted and outside of their typical emergence period. The likelihood of roost sites for these species being present within Area Z is NEGLIGIBLE.

### 4.2 FORAGING HABITAT

- 4.2.1 Area Z provides a good foraging resource for common pipistrelle and soprano pipistrelle bats and low numbers of long-eared bat and *Myotis* species. Notable habitat features used by foraging bats included the tree canopy (particularly the canopy of oaks), ivy clad trees, bramble scrub and transitional habitat comprising trees, scrub, tall herbs and open grassland.

### 4.3 COMMUTING HABITAT

- 4.3.1 Observations/records of commuting common pipistrelle, soprano pipistrelle, a long-eared bat, noctule and serotine during or soon after the emergence period confirms that Area Z falls along a bat flight line.

### 4.4 POTENTIAL IMPACTS OF THE LANDSCAPING PROPOSALS

#### *Roost sites*

- 4.4.1 No less than 21 trees will be removed as part of the proposals. This will result in the loss of two HIGH, up to four MEDIUM and 11 LOW potential bat roost sites.
- 4.4.2 Field surveys identified a HIGH risk of a transient roost site, used by single or low numbers of common pipistrelle bats, within one of the trees in the north-eastern part of the survey area and additional surveys will need to be undertaken of sycamore T177, Prunus T177a and Sycamore T186, prior to their removal.

- 4.4.3 If a bat roost is confirmed, an appropriate mitigation strategy would need to be followed (including the application for a European Protected Species Mitigation licence from Natural England) to ensure compliance with the bat legislation.
- 4.4.4 Provided appropriate mitigation measures are implemented during works, and with the installation of bat boxes (No.8) within the Underhill Road and Ryedale Road Nature Conservation Buffer Area, the overall impact on the local bat population should be NEGLIGIBLE.

***Foraging habitat***

- 4.4.5 Some habitat features currently used by foraging bats would be lost as part of the proposals. These include: the removal of 11 mature trees that are clad with ivy; the removal of significant areas of bramble scrub and transitional habitat comprising trees, scrub, tall herbs and open grassland.
- 4.4.6 The creation of a low intervention conservation area (Underhill Road and Ryedale Road Nature Conservation Buffer Area) in the northern part of the site and new planting with native trees and shrubs, native hedgerows and the laying of wildflower rich turf to include meadow fringes within the remainder of the site will enhance the biodiversity value of Area Z in the long-term. The overall impact on foraging bats is therefore assessed as NEGLIGIBLE.

***Commuting habitat***

- 4.4.7 Boundary and scattered trees, which form a linear feature within the northern part of the site, will be retained enabling continued use of these features by commuting bats.
- 4.4.8 Proposals to provide new planting with deciduous trees and native hedges will increase the extent of linear vegetated features that can be used by bats as flight-lines
- 4.4.9 The impact of the proposals on established bat flight-lines is assessed as NEGLIGIBLE.

## 5. RECOMMENDATIONS

### 5.1 MITIGATION STRATEGY FOR TREE REMOVAL

- 5.1.1 All trees that are scheduled for removal but which were not surveyed during the Preliminary Bat Assessment should be inspected by a suitably qualified ecologist prior to their removal (T11\*, T155, T158, T181, T58\*, T195 and T183). This survey should be carried out at an appropriate time of year i.e. November to April, following vegetation die back and leaf fall.
- 5.1.2 Where possible, the landscaping proposals should avoid the loss of mature trees that support features of HIGH (T177 & T147) and MEDIUM (T11\*, T155, T158 and T183) roost potential. If removal of these trees is unavoidable, they must be climbed or reached by a suitable working platform and all potential roost features surveyed by a class 2 licensed bat ecologist using an endoscope.
- 5.1.3 If a bat roost is confirmed from these surveys, further works to the tree and any trees within the immediate vicinity will need to be postponed until a European Protected Species Mitigation Licence is issued by Natural England.
- 5.1.4 Works to trees that support features of HIGH and MEDIUM value to bats as a roost, but where roost sites are not confirmed, should be carried out under the advice of the licensed bat ecologist.
- 5.1.5 Tree works should ideally be carried out between mid-September and the end of October to avoid the bat hibernation season and bird nesting season. Works should only proceed under dry conditions and when day and night time temperatures are 8°C or above.
- 5.1.6 Tree surgeons should be briefed on bats and their field signs, features that offer suitable bat habitat and the bat legislation prior to the commencement of works. The contact details of a licensed bat ecologist should be made available.
- 5.1.7 All trees should be felled in sections that are lowered to the ground, (rather than clear felled) to minimise disturbances to the surrounding habitat.
- 5.1.8 Trunks or stems that have cavity features should be sectioned at least 500mm above and below the cavity so that it remains intact. Ideally, these sections should be ratchet strapped to a nearby surrogate tree (a Category A or B tree that will not be impacted by the works), at approximately the same height and altitude to how it was originally found so that the features continue to be available to roosting bats.
- 5.1.9 If bats are discovered during works, further works to the tree must stop immediately and advice sought from a licensed bat ecologist on how best to proceed.
- 5.1.10 Birds were confirmed to be nesting on site. To ensure compliance with the bird legislation, any vegetation clearance works should be completed during the period of September to February, which is outside the main bird nesting season. Some bird species may nest outside this core period and therefore due care and attention should be given when undertaking potentially damaging works at any time of year. All



potential nesting habitat should be checked by a suitably qualified ecologist prior to the commencement of works. If nesting birds are found, works within a 5m radius would need to be postponed until the young have fledged.

## **5.2 BAT BOXES/BIRD NEST BOXES**

- 5.2.1 Eight bat boxes will be provided within the Underhill Road and Ryedale Road Nature Conservation Buffer Area (see Appendix A2, Plan 5). Woodcrete bird nest boxes will also be installed on the same trees as the bat boxes to reduce competition of bat boxes by nesting birds. Bat boxes should be positioned three metres or higher above ground in a place where there is a clear flight path for bats entering and leaving the box. The aspect of the box should capture the sun for part of the day and therefore be south (or southeast/southwest) facing (JNCC 2004; BCT 2003).
- 5.2.2 Given the high likelihood of a roost site occurring within one of the trees in the north-east corner of the site and the removal of tree T177, which supports features of HIGH roost potential, two additional bat boxes should be installed onto tree T175 or T187 to provide compensatory roost habitat.
- 5.2.3 Bat and bird boxes should be surveyed annually in September or October by a suitably qualified ecologist. All nesting material should be removed and vegetation should be cleared from around the box entrances (as required) to maintain a clear entry path. All data collected from these surveys should be sent to the local records centre.
- 5.2.4 Where possible, bat and bird boxes should be provided throughout the whole cemetery site to enhance the value of the cemetery for roosting bats and nesting birds in the long term.

## REFERENCES

- BAT CONSERVATION TRUST (2012). *Bat Surveys – Good Practice Guidelines - 2nd edition*. Bat Conservation Trust, London
- HMSO (1981). *The Wildlife and Countryside Act (WCA)* (as amended).
- HMSO (2000). *The Countryside and Rights of Way Act (CRoW)*.
- HMSO (2010). *The Conservation of Habitats and Species Regulations 2010*.
- JNCC (2004). *Bat Worker's Manual*. 3<sup>rd</sup> Edition. Edited by A.J. Mitchell-Jones & A.P. McLeish, Joint Nature Conservation Committee, Peterborough.
- LONDON BAT GROUP (2015). Bat records as requested by Huma Pearce, Mostlybats – Records within 4 x 4km square centred on of TQ34701 74173.
- LONDON BIODIVERSITY PARTNERSHIP (2007). *London Biodiversity Action Plan* [Online]. Available at: <http://www.lbp.org.uk/londonap.html>.
- NATURAL ENGLAND (2013). Natural England Technical Information Note TIN092. <http://publications.naturalengland.org.uk/publication/31005>
- NERC (2006). *Habitats and species of Principal Importance*. Available at: <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>
- ODPM (2005) *Biodiversity & Geological Conservation: Statutory Obligations & Their Impact Within The Planning System*. Government Circular.

## **A1: LEGISLATION**

## BAT LEGISLATION

All bat species in the UK are fully protected under The Conservation (Natural Habitats, &c.) Regulations 2010 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or taking (capture) of bats
- Deliberate disturbance of bats in such a way as to:
  - impair their the ability to survive, breed, or rear or nurture their young; or
  - affect significantly the local distribution or abundance of bat species; or
- impair their ability to hibernate or migrate
- Damage or destruction of a bat breeding site or resting place i.e. roost
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

All bat species in the UK are also protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, it is an offence to:

- Intentionally or recklessly disturb any bat while it is occupying a structure or place which it uses for shelter or protection
- Intentionally or recklessly obstruct the access to any place of shelter or protection used by bat(s)
- Sell, offer or expose for sale, possess or transport a bat(s) for the purpose of sale.

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will need to be applied for to allow derogation from the relevant legislation i.e. for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young, hibernate, migrate). In certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded *de facto* protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost.

## BIRD LEGISLATION

All birds, their nests and eggs are protected under Sections 1-8 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to kill, injure or take any wild bird, or to take or destroy their eggs. It is also an offence to take, damage or destroy the nest of any wild bird while it is in use or being built. Certain species receive additional special protection under Schedule 1 of the Act.

- Intentional or reckless disturbance while it is building a nest or is in, on or near a nest containing eggs or young;
- Intentional or reckless disturbance of dependent young of such a bird.

Species listed under Annex 1 of the European Community Directive on the conservation of Wild Birds (79/409/EEC) qualify sites for designation as a Special Protection Area (SPA) if certain selection criteria are met, such as a site supports internationally important populations of an Annex 1 species.

## **CONSERVATION (NATURAL HABITATS ETC) REGULATIONS 2010**

The species protection provision of the EC Habitats Directive 1992, as implemented by the Conservation of Habitats and Species Regulations 2010, comprises three “derogation tests” which must be applied by the Local Planning Authority when deciding whether to grant planning permission for a development that could harm a European Protective Species. The three tests are that:

- The activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety
- There must be no satisfactory alternative; and
- Favourable Conservation Status (FCS) of the species must be maintained.

It is the responsibility of the applicant to submit sufficient information to address these tests when applying for planning permission. For development activities, an EPSM Licence application can only be obtained after planning permission has been granted. However, the granting of planning permission does not guarantee that a licence will be issued by the relevant countryside agency.

## **NATIONAL PLANNING POLICY FRAMEWORK (2012)**

The National Planning Policy Framework (NPPF) (2012) sets out the Government’s national policies on different aspects of planning in England. Section 10 paragraphs 109 to 125 details planning policies on the conservation and enhancement of the natural environment. Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

In summary:

The planning system should contribute to and enhance the natural and local environment by: ‘minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.’ (NPPF Section 10, para 109)

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused (Section 10, para 118).
- Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted (Section 10, para 118).
- Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted (Section 10, para 118).
- Opportunities to incorporate biodiversity in and around developments should be encouraged (Section 10, para 118).
- Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside

ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss (Section 10, para 118).

- Potential Special Protection Areas and possible Special Areas of Conservation, listed or proposed Ramsar sites and sites identified or required as compensatory measures for adverse effects on European sites, should be given the same protection as European sites (Section 10, para 118).
- The presumption in favour of sustainable development (para 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Section 10, para 119).
- Planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation (Section 10, para 125).

Local planning authorities must take account of the conservation of protected species when determining planning applications. The presence of protected species is a material consideration when assessing a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. This requirement has important implications for bat surveys as it means that, where there is reasonable likelihood of bats being present and being affected by the development, surveys must be carried out before planning permission is considered' (BCR 2012). In order for the Local Planning Authority to adequately assess a development proposal against National and Local Planning Policy, full comprehensive ecological surveys need to be carried out and suitable mitigation strategies compiled prior to the submission of any planning application. This information will be reviewed by the Local Planning Authority in consultation with the relevant countryside agency and other conservation bodies.

Any developer should, in the first instance, consult the relevant Local Plans to assess the suitability of their proposal (refer to NPPF Section 10 paras 113 to 117).

## **NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006 (NERC)**

Part 3, Section 40 of the NERC Act 2006 states that 'every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity', otherwise known as the Biodiversity Duty. Under Section 41 of the Act, the Secretary of State must publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity. This list is based on those species listed in the UK Biodiversity Action Plan (BAP) as priority species. The S41 list replaces the list published under Section 74 of the Countryside and Rights of Way (CROW) Act 2000.

## **BIODIVERSITY ACTION PLAN**

In 1994 the UK Government published its response to the Convention on Biological Diversity that it signed along with over 150 other nations at the Rio Earth Summit in 1992. Biodiversity – the UK Action Plan (HM Government 1994) and subsequent publications (e.g. UK Steering Group 1995) set out a programme for the national Biodiversity Action Plan (BAP), including the development of targets for biodiversity, and the techniques and actions necessary to achieve them. UK BAP priority habitats were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The UK BAP priority species were those that are of conservation concern, either because they are rare in an international or national context or have undergone serious declines in their populations in recent years. The original lists of UK BAP priority habitats and UK BAP priority species was created between 1995 and 1999, and was revised in 2007, following publication of the Species and Habitats Review Report. Following this

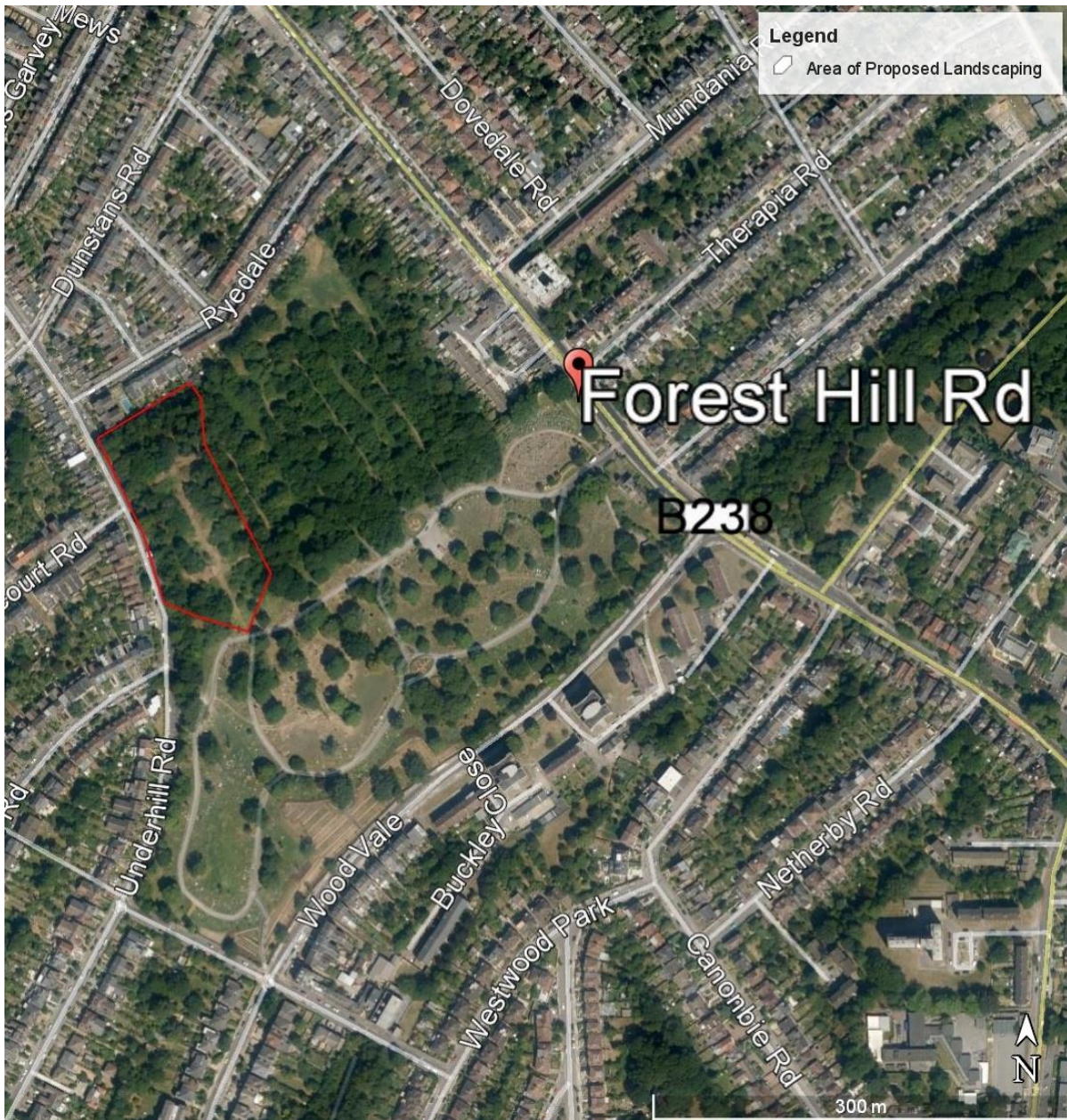
review, the list of UK BAP priority habitats increased from 49 to 65 and the list of UK BAP priority species increased from 600 to 1150.

Biodiversity Action Plans (BAPs) set out actions for the conservation and enhancement of biological diversity at national, regional and local level. They consist of both Habitat Action Plans (HAPs) and Species Action Plans (SAPs) and species and habitats listed within these are defined as being of Principal Importance for the Conservation of Biodiversity under Section 41 of the NERC Act 2006. Local authorities must consider these species and habitats when determining planning applications.

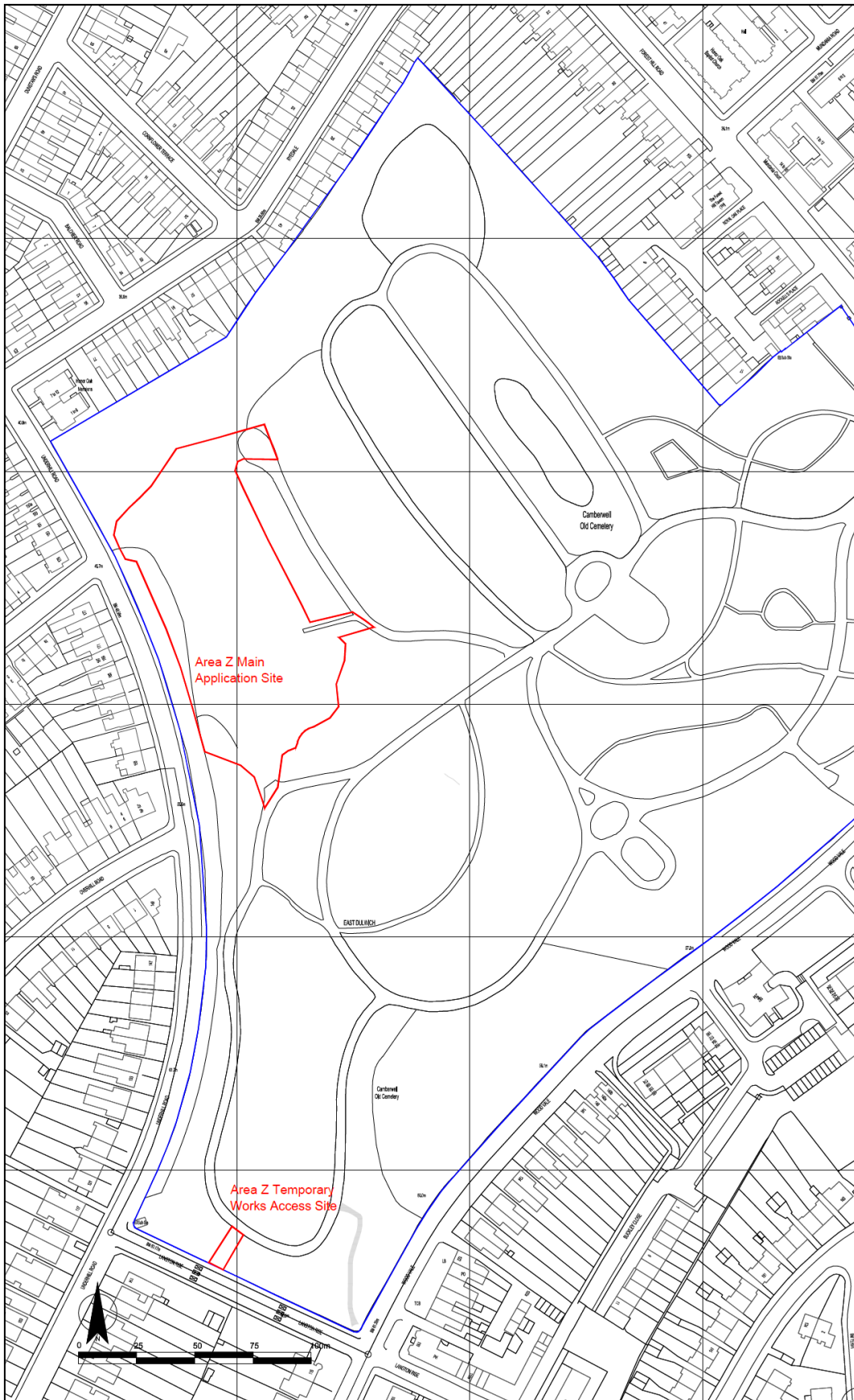
**A2: PLANS**



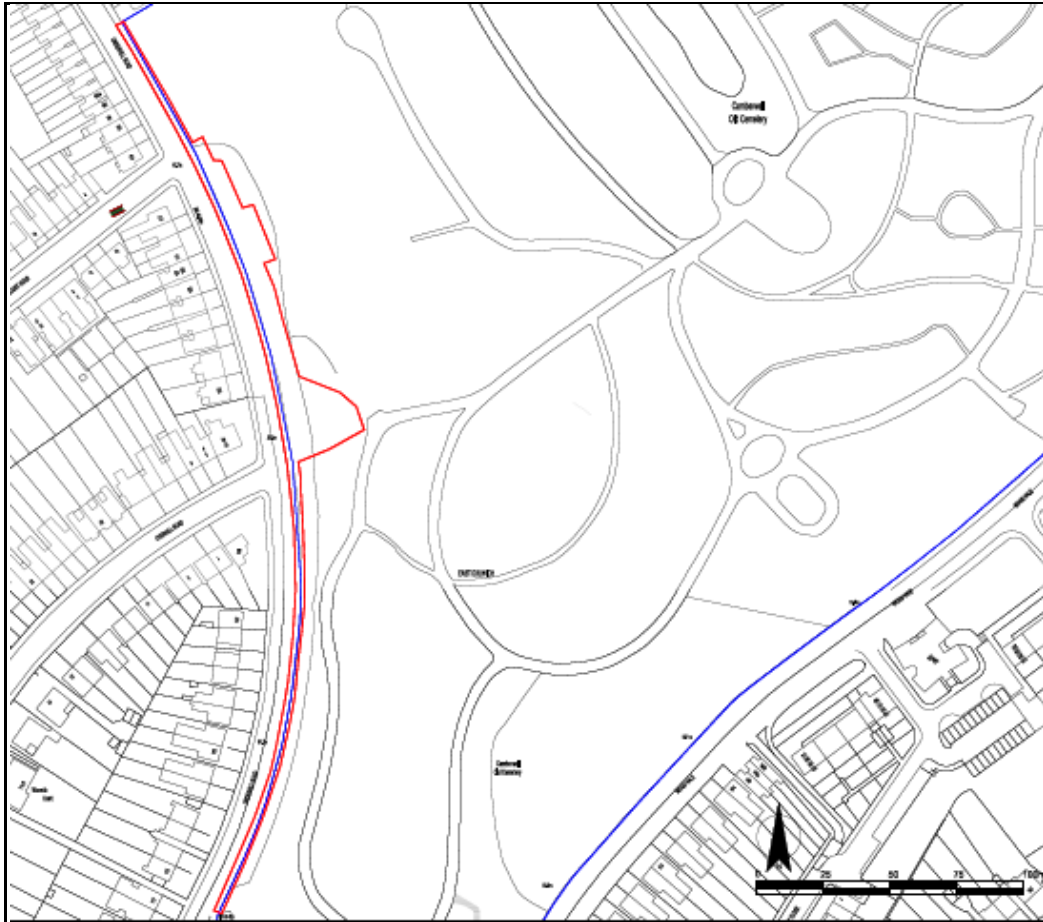
**Plan 1: Aerial view of Camberwell Old Cemetery showing the location of Area Z.**



**Plan 2: Area of proposed remediation and landscaping works within Area Z at Camberwell Old Cemetery**



**Plan 3: Works area associated with the installation of a new boundary fence and pedestrian access on Underhill Road**



**Plan 4: Original works plan provided for the Preliminary Bat Assessment, showing trees to be removed.**








Plan 5: Proposed landscaping works at Area Z, Camberwell Old Cemetery







### **A3: TREE ASSESSMENT**




**Table 2: Tree Assessment**

Tree Number	Species	Description of potential roost features	Photograph
<b>HIGH ROOST POTENTIAL</b>			
T177	Sycamore	<p>Four woodpecker holes/cavity features at 5-6 m, east and east-north-east facing associated with eastern stem. Western stem clad with ivy up to 7-8m.</p> <p>Parakeets were nesting within the cavity features.</p>	
T177a	Prunus	<p>Located immediately adjacent to T177 which has HIGH roost potential.</p> <p>Removal works may cause disturbance to a potential roost site</p>	
T147	Norway maple	<p>Dead tree partially clad with ivy, Significant deadwood and lose bark at the crown. Cavity features and fissures south-west facing at 5-7m.</p>	

Tree Number	Species	Description of potential roost features	Photograph
<b>MEDIUM ROOST POTENTIAL</b>			
T176	Sycamore	Ivy clad to crown providing opportunities for bats to roost between the ivy and the main stem. Cavities may be present under the ivy.  Ivy clad trees are common at the site.	
T187	Sycamore	Clad with ivy and cavity at c.10m, south-west facing.  <b>OUTSIDE OF WORKS AREA</b>	
T182	Sycamore	Multiple stemmed (No.5). Small south facing cavity and callus growth at c.8m  <b>OUTSIDE OF WORKS AREA</b>	
T11*	Salix	Requires ground level tree inspection/climbed survey prior to works	
T155	Horse chestnut	Requires ground level tree inspection/climbed survey prior to works	
T158	Sycamore	Requires ground level tree inspection/climbed survey prior to works	
183	Sycamore	Requires ground level tree inspection/climbed survey prior to works	



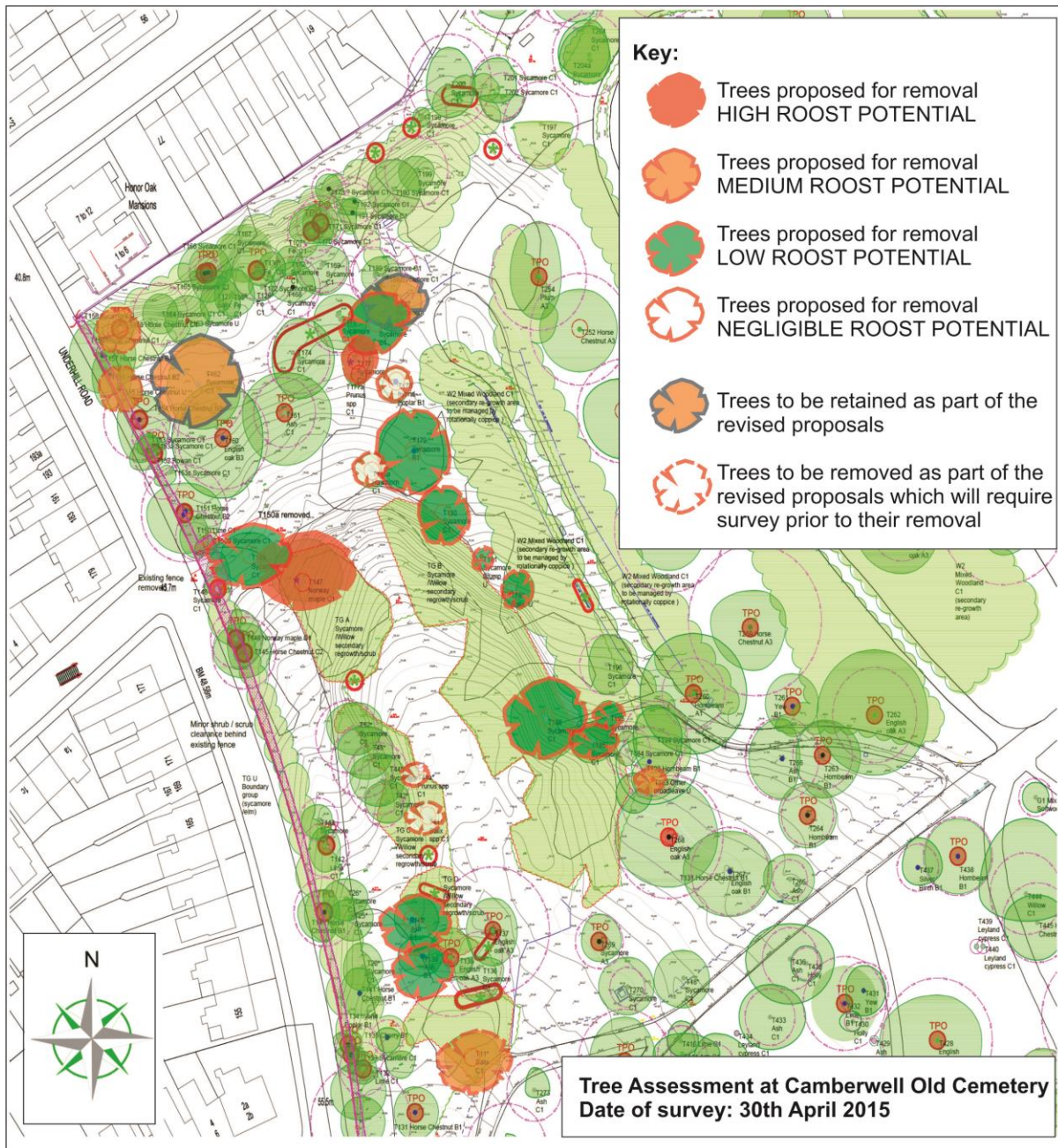
Tree Number	Species	Description of potential roost features	Photograph
<b>LOW ROOST POTENTIAL</b>			
T149	Sycamore	Two stemmed with ivy clad to crown providing opportunities for bats to roost between the ivy and the main stem. Cavities may be present under the ivy.	
T140	Ash	Only shallow fissured/ cavity features identified.	
T139	Ash	Clad with dense ivy which provides opportunities for bats to roost between the ivy and the main stem. Cavities may be present under the ivy.	
T180	Sycamore	Multi-stemmed. Clad with ivy to crown. Opportunities for bats to roost between the ivy and the main stem. Cavities may be present under the ivy.	

Tree Number	Species	Description of potential roost features	Photograph
T179	Sycamore	Single stemmed. Clad with ivy almost to crown. Opportunities for bats to roost between the ivy and the main stem. Cavities may be present under the ivy.	
T186	Sycamore	Dead tree. View were obstructed by adjacent vegetation but cavity features are likely.	
T185	Sycamore	Ivy clad almost to crown provides opportunities for bats to roost between the ivy and the main stem. Cavities may also be present under the ivy.	

Tree Number	Species	Description of potential roost features	Photograph
T58*	Salix	Requires ground level tree inspection/climbed survey prior to works	
T181	Sycamore	Requires ground level tree inspection/climbed survey prior to works	
195	Sycamore		

Tree Number	Species	Description of potential roost feature
<b>NEGLIGIBLE ROOST POTENTIAL</b>		
T178	Hybrid poplar	No cavity features identified.
T41*	Salix	Based on results of arboricultural survey, there are unlikely to be any suitable cavity features.
T44*	Prunus	Based on results of arboricultural survey, there are unlikely to be any suitable cavity features.
T179a	Hawthorn	Based on results of arboricultural survey, there are unlikely to be any suitable cavity features

**Plan 6: Map showing the results of the tree assessment**



## **A4: EMERGENCE AND ACTIVITY SURVEY RESULTS**

**KEY:**

Species code	Common name	Scientific name
p45	Common pipistrelle	<i>Pipistrellus pipistrellus</i>
p55	Soprano pipistrelle	<i>P. pygmaeus</i>
Es	Serotine	<i>Eptesicus serotinus</i>
NI	Leisler's bat	<i>Nyctalus leisleri</i>
LE	Long-eared bat	<i>Plecotus sp.</i>
Myotis	Myotis species	<i>Myotis sp.</i>

**Evening bat emergence and activity survey 11<sup>th</sup> May 2015.**

Start time: 20:15 Sunset: 20:38 End time: 22:15

18.1-15.1°C, 73% humidity, 5% cloud cover, gusty breeze.

**Surveyor 1: North-east**

Time	Species	Comments
20:47	Soprano pipistrelle	<b>9 minutes after sunset.</b> Very faint pass, not seen
20:58	Common pipistrelle	<b>20 minutes after sunset.</b> Bat pass, not seen.
21:03	Serotine	<b>25 minutes after sunset.</b> Bat pass from the north, commuting south.
21:06	Common pipistrelle	Very faint record, not seen.
21:07- 21:09	Common pipistrelle Soprano pipistrelle	Common pipistrelle feeding between the trees, joined briefly by a soprano pipistrelle
21:13- 21:14	Common pipistrelle	2 bats arrived from south-west and fed briefly by ivy clad sycamores
21:17	Soprano pipistrelle	Feeding pass, not seen
21:34	Common pipistrelle	Bat pass, not seen and brief feeding episode
21:36	Common pipistrelle	Bat feeding
21:53	Common pipistrelle	Bat feeding
21:56	Common pipistrelle	Bat feeding
21:58	Common pipistrelle	Bat pass not seen
22:03	Common pipistrelle	Bat pas not seen
22:10	Common pipistrelle	very faint pass

**Surveyor 2: North-west**

Time	Species	Comments
20:43- 20:46	Soprano pipistrelle	<b>5 minutes after sunset.</b> Bat feeding by sycamore, arrived from south-west
20:56	Common pipistrelle	<b>18 minutes after sunset.</b> Bat pass from north-east and fed briefly
21:12	Common pipistrelle	Bat pass from east and fed briefly
21:15	Soprano pipistrelle	Bat pass
21:31	Common pipistrelle	Bat pass, not seen
21:33	Common pipistrelle	2 bat passes, not seen
21:35	Common pipistrelle	bat pass, not seen
21:41	Common pipistrelle	Very faint brief pass
21:51	Common pipistrelle	Not seen
22:02	Common pipistrelle	Faint pass, not seen
22:06	Common pipistrelle	Bat pass, not seen.

**Surveyor 3: West**

Time	Species	Comments
21:43	Soprano pipistrelle	<b>5 minutes after sunset.</b> Bat pass, not seen – likely from the south-west
20:59	Serotine	<b>21 minutes after sunset.</b> Bat pass, not seen
21:02	Leisler's bat	<b>24 minutes after sunset.</b> Faint brief pass, not seen
21:05	Common pipistrelle	Very faint brief record
21:07	Soprano pipistrelle	Brief pass, not seen
21:13- 21:22	Common pipistrelle	bat feeding in clearing dominated by brambles at the centre of the northern part of site
21:16	Soprano pipistrelle	2 bats pass into site from south-west
21:32- 21:40	Common pipistrelle	Bat pass from south-west (road) into the site and fed over brambles
21:33	long-eared?	<b>55 minutes after sunset.</b> Bat pass into site from west, no echolocation calls
21:33	Soprano pipistrelle	bat feeding pass
21:34	common pipistrelle	bat feeding in clearing
21:41	Common pipistrelle	bat feeding in clearing at north-centre of site
21:43	Common pipistrelle	bat feeding in clearing at north-centre of site
21:52	Common pipistrelle	Bat pass not seen
22:06	Common pipistrelle	Bat pass east towards the road

**Unmanned detector: at centre of clearing in the southern part of site**

Time	Species	
20:58:52	Serotine	<b>21 minutes after sunset.</b>
21:01:57	Leisler's bat	<b>24 minutes after sunset.</b>
21:21:32	Common pipistrelle	
21:32:01	Common pipistrelle	
22:15:51	Soprano pipistrelle	

**Plan 7: Results of the emergence and activity survey on the 11<sup>th</sup> May 2015**





**Evening bat emergence and activity survey 3<sup>rd</sup> September 2015.**

Start time: 19:35      Sunset: 19:45      End time: 21:30

16°C, 100% cloud cover, light drizzle during the first hour of survey.

**Surveyor 1: North-east**

Time	Species	Comments
19:39	Common pipistrelle	Bat seen between feeding between ivy clad sycamores
19:41 – 19:57	Common pipistrelle	1-2 bats feeding between ivy clad trees in the north-east part of the site. Initially a single bat fed up until 19:46 when a second bat arrived from the north
19:56	Soprano pipistrelle	Bat fed at tree canopy
20:00	Common pipistrelle	Brief feeding record
20:02	Common pipistrelle	Bat feeding by ivy clad trees
20:03 – 20:07	Soprano pipistrelle	Faint records, bat seen feeding at canopy height
20:08	Common pipistrelle	Bat pass
20:10 – 20:16	Common pipistrelle	1-2 bats seen feeding between the ivy clad trees and canopy
20:24	Soprano pipistrelle	Bat pass not seen
20:26	Common pipistrelle	Bat feeding pass
20:32 – 20:34	Common pipistrelle	2 bats feeding between ivy clad trees
20:35 – 21:01	Common pipistrelle	1-2 bats feeding between ivy clad trees and at the canopy
20:42	Soprano pipistrelle	Bat pass
21:02 – 21:05	Common pipistrelle	2-3 bats seen feeding over bramble scrub in the northern part of the site
21:11 – 21:22	Common pipistrelle	Bat feeding at the canopy of the oak at the southern boundary of the survey area, at the edges of the bramble and butterfly bush scrub and over the grassland.

**Surveyor 2: North-west**

Time	Species	Comments
19:37	Common pipistrelle	Bat pass not seen
19:38 – 19:54	Common pipistrelle	Up to 3 bats seen feeding over brambles in the northern part of the site and at the canopy of the oak and adjacent ivy clad trees. A second bat arrived on site from the north-east. Two bats fed with social calls noted. A third bat arrived on site at 19:51 from the north-east.
19:54	Common pipistrelle	1-2 bats intermittently feeding in the north-west part of the site at the canopy of the trees.
19:56	Common pipistrelle	Bat fed at tree canopy and over brambles in the northern part of the site
20:02	Common pipistrelle	Brief feeding pass
20:03	Common pipistrelle	Brief feeding pass
20:06	Common pipistrelle	Bat feeding pass
20:07 – 20:08	Common pipistrelle	2 bats passed into the site from the north-east and fed at the tree canopy
20:10	Soprano pipistrelle	Faint record
20:15	Common pipistrelle	Bat seen passing over the tree canopy
20:16	Common pipistrelle	Brief feeding episode

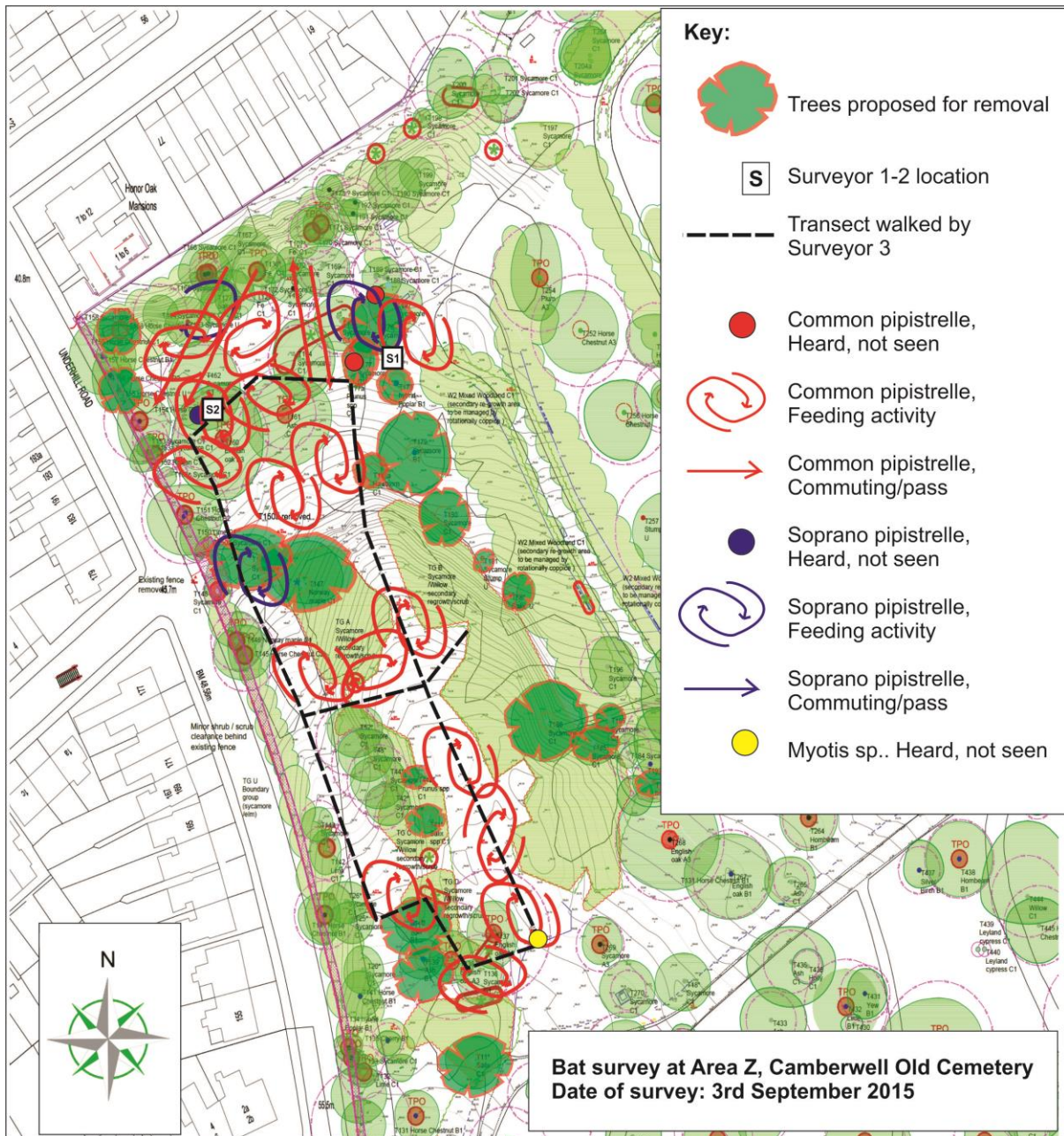
Time	Species	Comments
20:27- 20:28	Common pipistrelle	Bat feeding at canopy of the oak
20:33 – 20:47	Common pipistrelle	1-2 bats seen feeding along the tree canopy
20:48 – 21:09	Common pipistrelle	2 bats seen feeding at the canopy of the trees and over the brambles. These were joined by a third bat at 20:53. High levels of social calls were noted at 21:09
21:12 – 21:17	Common pipistrelle	2 bats feeding by the canopy of the oak tree. Strong social calls were noted at 21:13
21:20	Common pipistrelle Soprano pipistrelle	Bats seen feeding between the tree canopy and bramble scrub

**Surveyor 3: Transect around the site**

Time	Species	Number of contacts per minute	Comments – GPS
19:52	p45	2	51.45039 -0.06297
19:53	p45	10	51.45039 -0.06297
19:54	p45	13	51.45004 -0.06269
19:55	p45	13	51.44989 -0.06265
19:56	p45	13	51.44988 -0.06263
19:57	p45	9	51.44967 -0.06289
19:58	p45	1	51.44967 -0.06289
19:59	p45	7	51.4501 -0.06302
20:00	p45	2	51.45011 -0.06302
20:01	p45	1	51.45013 -0.06298
20:04	p45	1	51.45021 -0.06298
20:06	p45	1	51.45024 -0.06295
20:11	p45	2	51.45026 -0.06295
20:12	p45	4	51.45027 -0.06297
20:13	p45	2	51.45023 -0.06325
20:17	p45	1	51.44992 -0.06275
20:18	p45	11	51.44981 -0.06268
20:19	p45	11	51.4498 -0.06268
20:20	p45	8	51.44981 -0.06267
20:21	p45	4	51.44984 -0.06262
20:23	p45	1	51.44979 -0.06303
20:25	p45	2	51.44983 -0.0631
20:34	p55	1	51.45039 -0.0635
20:35	p45	1	51.45059 -0.06367
20:36	p45	6	51.45072 -0.06362
20:37	p45	2	51.45074 -0.06362
20:38	p45	4	51.45079 -0.06358
20:39	p45	4	51.45081 -0.0635
20:40	p45	4	51.45081 -0.0635
20:41	p45	4	51.45081 -0.0635
20:42	p45	1	51.45076 -0.06352
20:43	p45	5	51.45074 -0.06357
20:44	p45	4	51.45072 -0.06362

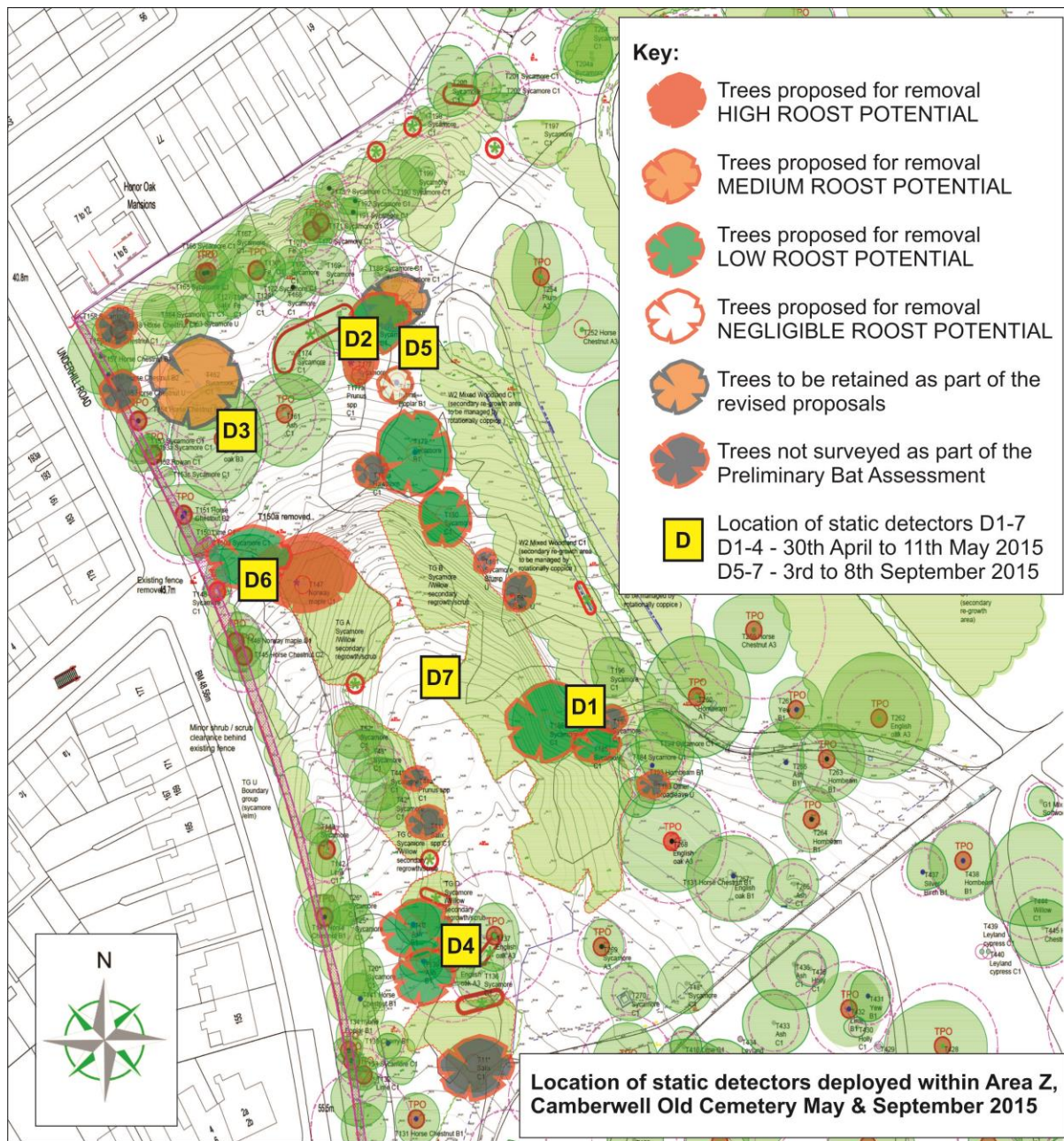
Time	Species	Number of contacts per minute	Comments – GPS
20:45	p45	2	51.4507 -0.0636
20:46	p45	1	51.45077 -0.06357
20:47	p45	1	51.45073 -0.06348
20:48	p45	5	51.45074 -0.06358
20:49	p45	7	51.45082 -0.06352
20:51	p45	2	51.45082 -0.06307
20:52	p45	1	51.45081 -0.06302
20:53	p45	4	51.45092 -0.06327
20:55	p45	3	51.45088 -0.0631
20:56	p45	2	51.4509 -0.06303
20:57	p45	5	51.45089 -0.06318
20:58	p45	8	51.45091 -0.06323
20:59	p45	5	51.45095 -0.06322
21:00	p45	4	51.45082 -0.06338
21:01	p45	1	51.45088 -0.06328
21:04	p45	1	51.45022 -0.06293
21:05	p45	3	51.45023 -0.06297
21:12	p45	1	51.45077 -0.06322
21:13	p45	2	51.45073 -0.06357
21:14	p45	3	51.45072 -0.06362
21:15	p45	5	51.45073 -0.06342
21:16	p45	2	51.45071 -0.06342
21:21	p45	8	51.4498 -0.0626
21:23	Mn	1	51.44981 -0.06255
21:30	p45	1	51.4499 -0.06248

**Plan 8: Results of the emergence and activity survey on 3<sup>rd</sup> September 2015**



## **A5: STATIC DETECTOR SURVEYS**

**Plan 6: Location of the static detectors deployed within Area Z in May (D1-D4) and September (D5-D7) 2015.**



**Key:**

Species code	Common name	Scientific name
p45	Common pipistrelle	<i>Pipistrellus pipistrellus</i>
p55	Soprano pipistrelle	<i>P. pygmaeus</i>
Es	Serotine	<i>Eptesicus serotinus</i>
Nn	Noctule	<i>Nyctalus noctula</i>
Myotis	Myotis species	<i>Myotis sp.</i>

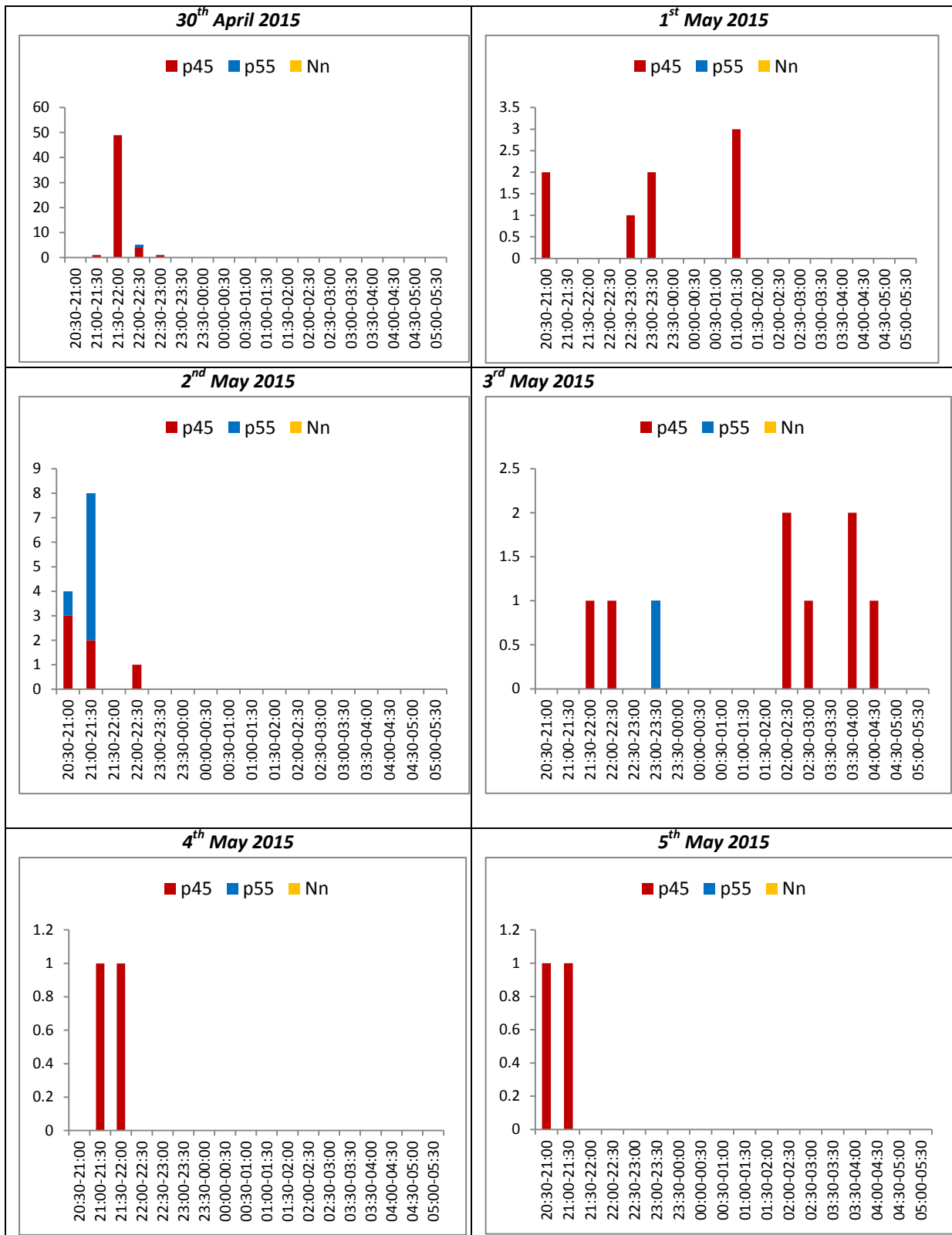
**Static Detector surveys completed in May 2015****Static detector surveys completed 30<sup>th</sup> April to 10<sup>th</sup> May 2015 (Graphs 1-4)****Weather conditions (Data from weatheronline.co.uk)**

Date	Sunset	Sunrise	Min Temperature	Rainfall/day
30 <sup>th</sup> April 2015	20:21	05:31	4	0
1 <sup>st</sup> May 2015	20:23	05:29	6	0
2 <sup>nd</sup> May 2015	20:25	05:27	6	1
3 <sup>rd</sup> May 2015	20:26	05:25	9	2
4 <sup>th</sup> May 2015	20:28	05:23	11	7
5 <sup>th</sup> May 2015	20:29	05:22	12	0
6 <sup>th</sup> May 2015	20:31	05:20	8	7
7 <sup>th</sup> May 2015	20:33	05:18	8.25	0
8 <sup>th</sup> May 2015	20:34	05:16	8	0.25
9 <sup>th</sup> May 2015	20:36	05:15	11.5	0
10 <sup>th</sup> May 2015	20:38	05:13	9	0

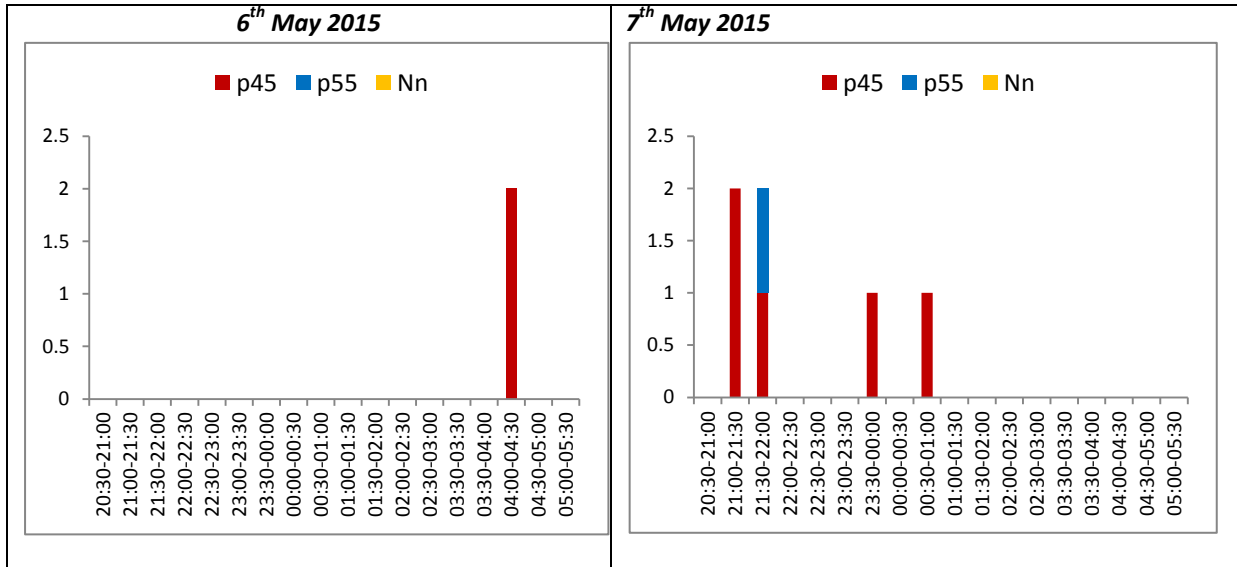
**Static detector surveys completed 3<sup>rd</sup> to 8<sup>th</sup> September 2015 (Graphs 5-7)****Weather conditions (Data from weatheronline.co.uk)**

Date	Sunset	Sunrise	Min Temperature	Rainfall/day
3 <sup>rd</sup> September 2015	19:43	06.14	9.5	1
4 <sup>th</sup> September 2015	19:40	06.15	11	0
5 <sup>th</sup> September 2015	19:38	06.17	9	1
6 <sup>th</sup> September 2015	19:36	06.19	6	0
7 <sup>th</sup> September 2015	19:33	06.20	8.5	0
8 <sup>th</sup> September 2015	19:31	06.22	10	0

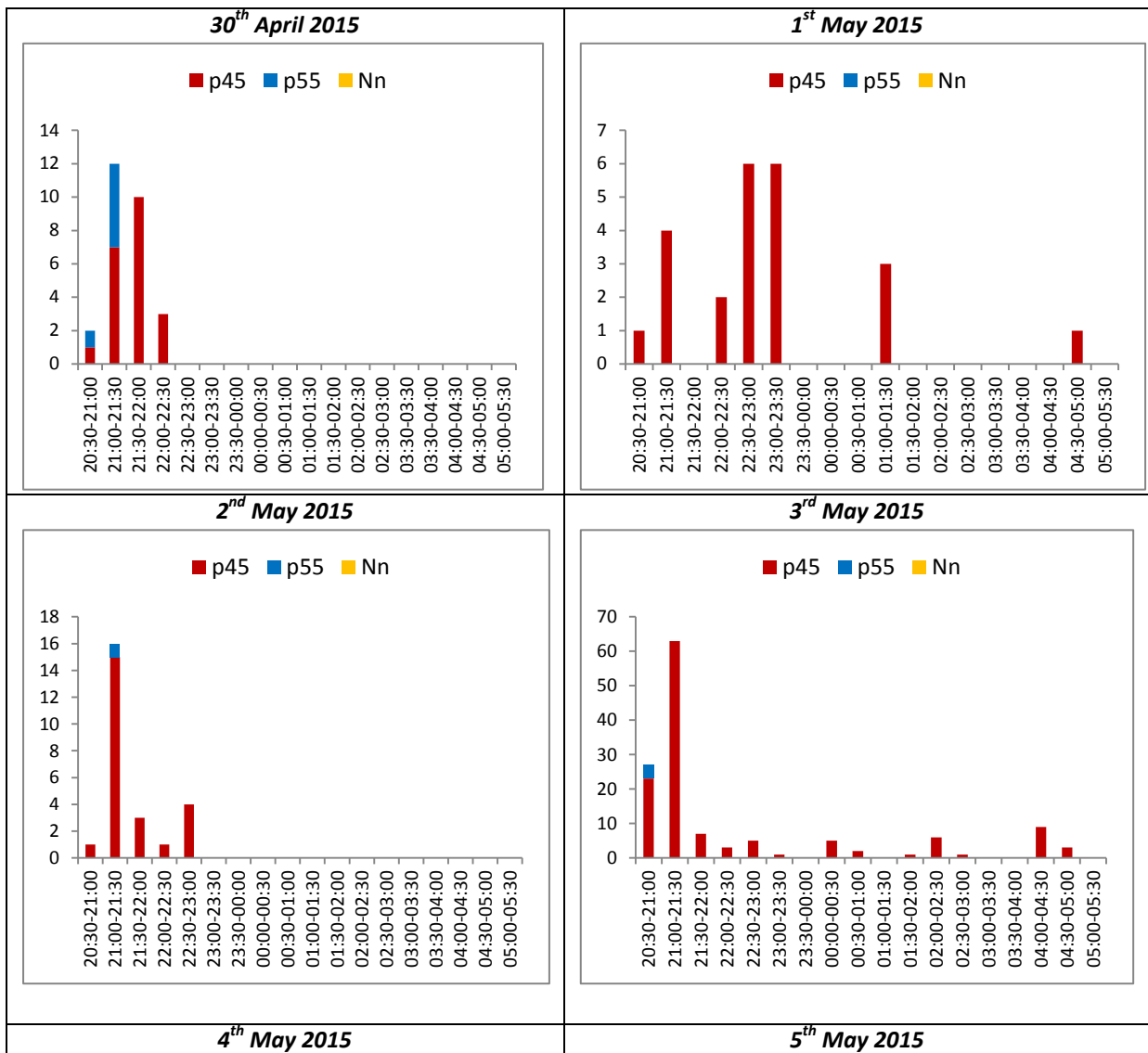
**Static Detector D1 - SE corner of the Area Z by T17 and T18 TQ4728 74143– 30<sup>th</sup> April to 8<sup>th</sup> May 2015**

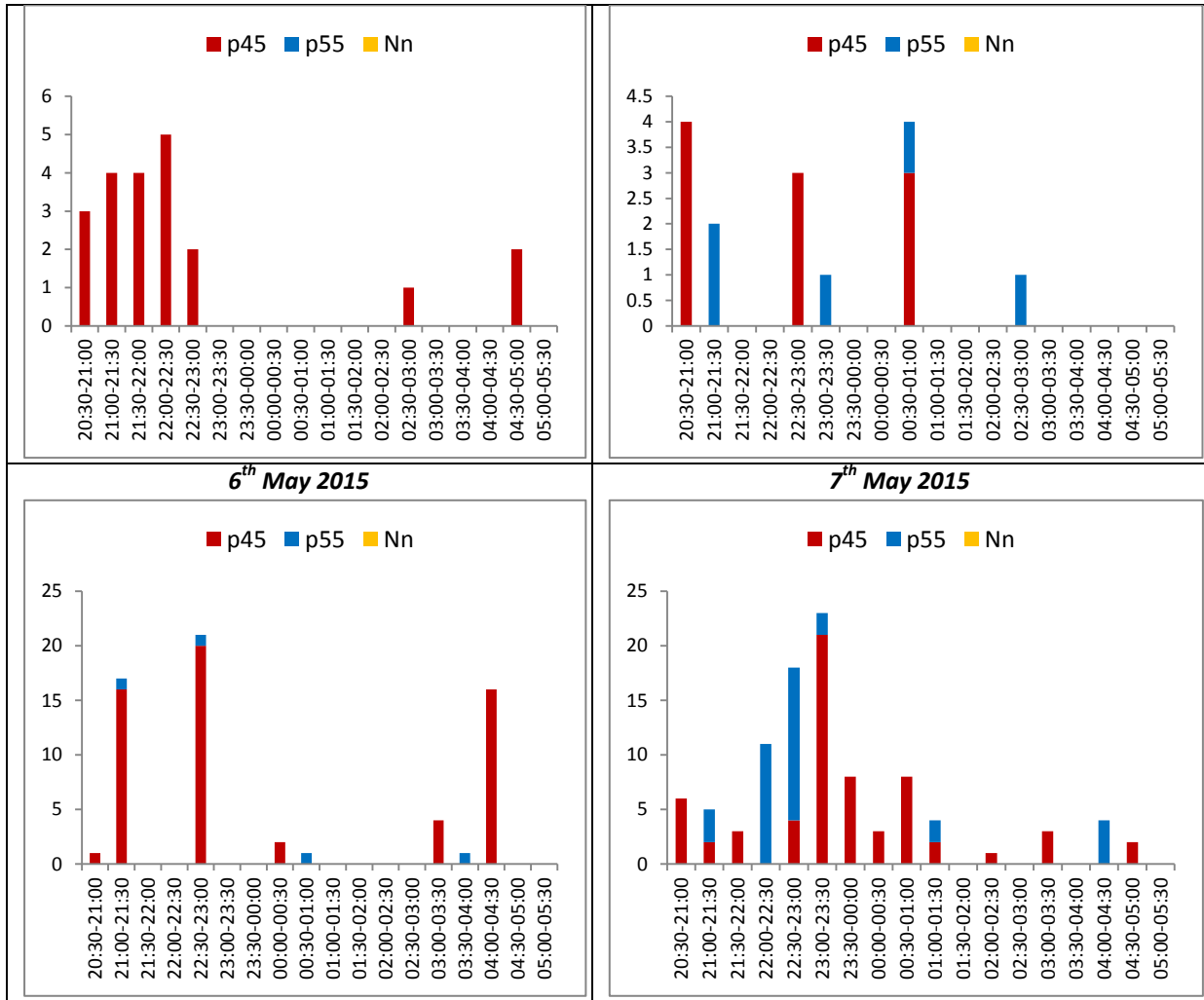




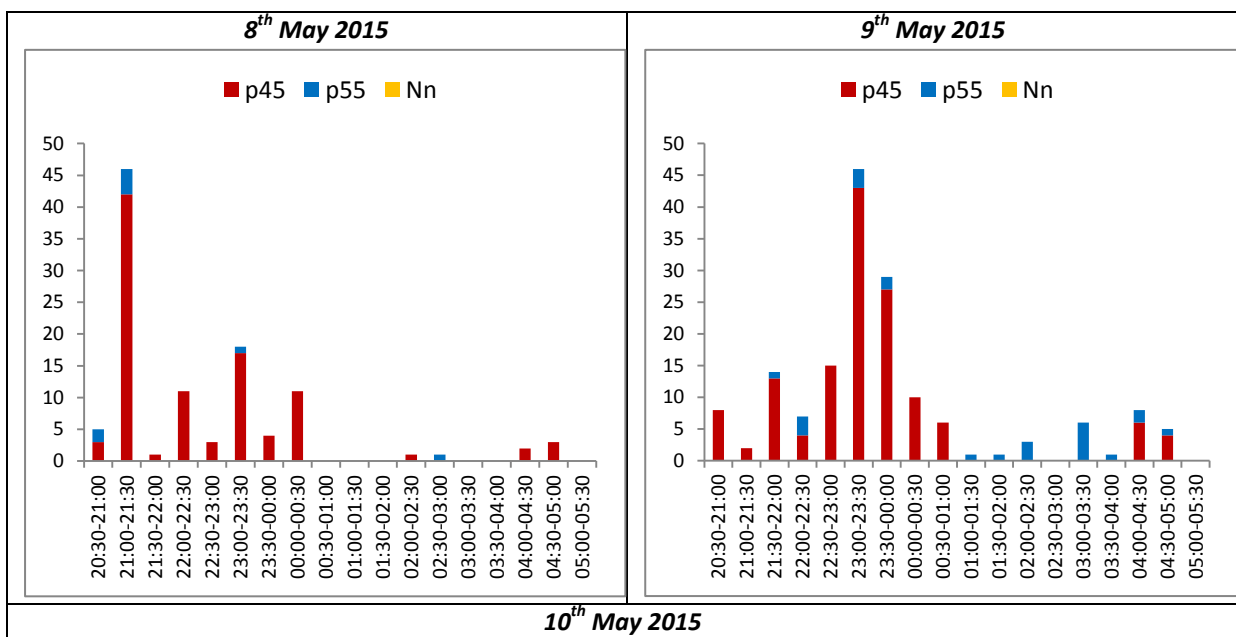


**Static detector D2 - NE part of the site by T1 – TQ34665 74215 - 30<sup>th</sup> April to 8<sup>th</sup> May 2015**

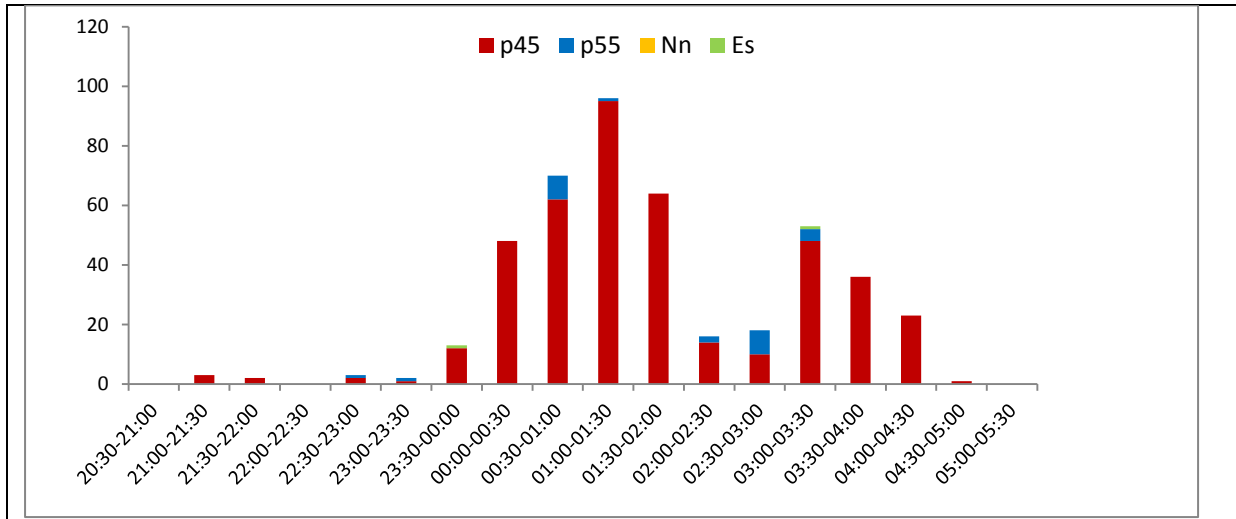




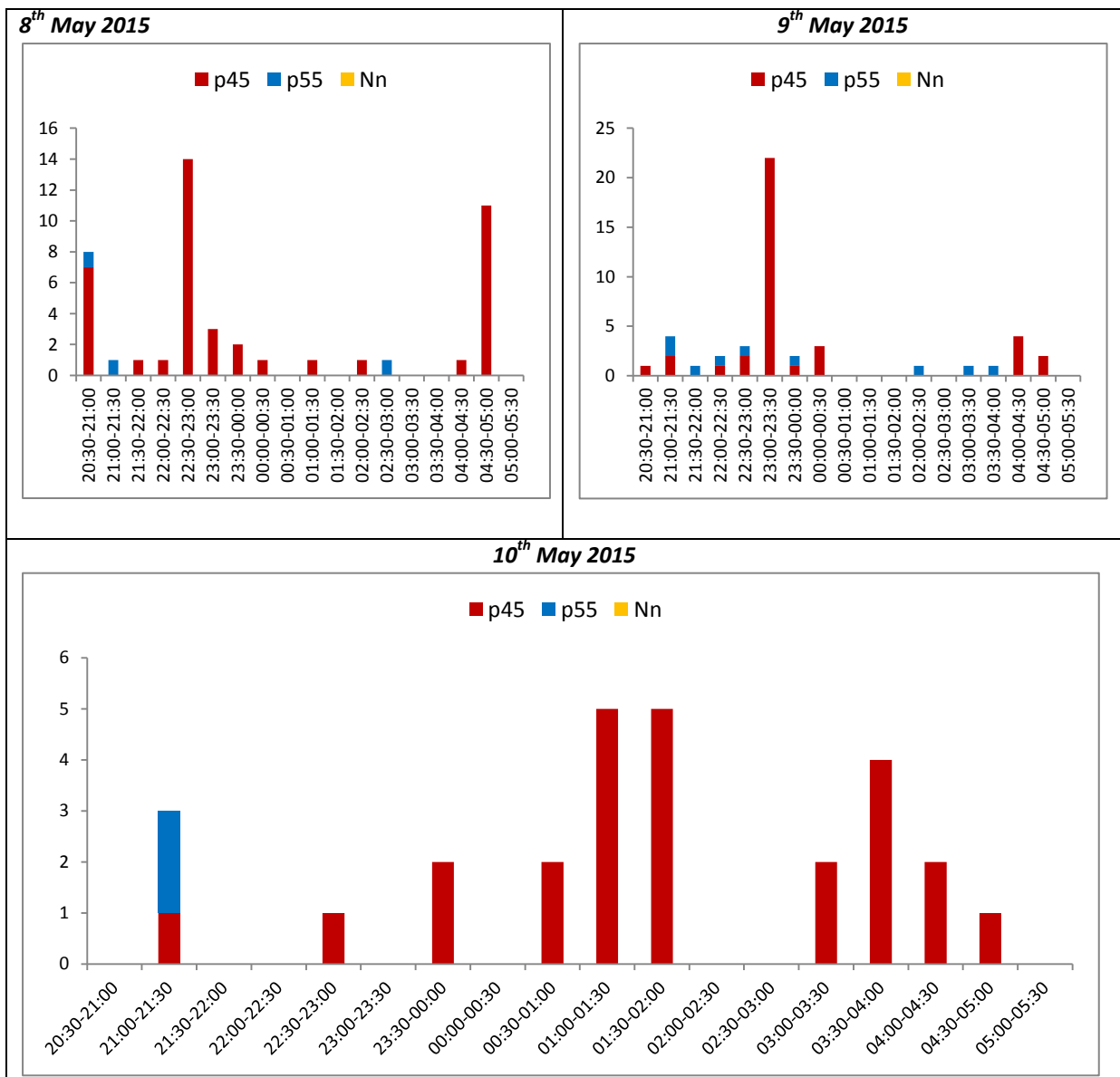
**Static Detector D3 - NW part of the site on between T8 and T9 – TQ34658 74202 - 8<sup>th</sup> to 11<sup>th</sup> May 2015**



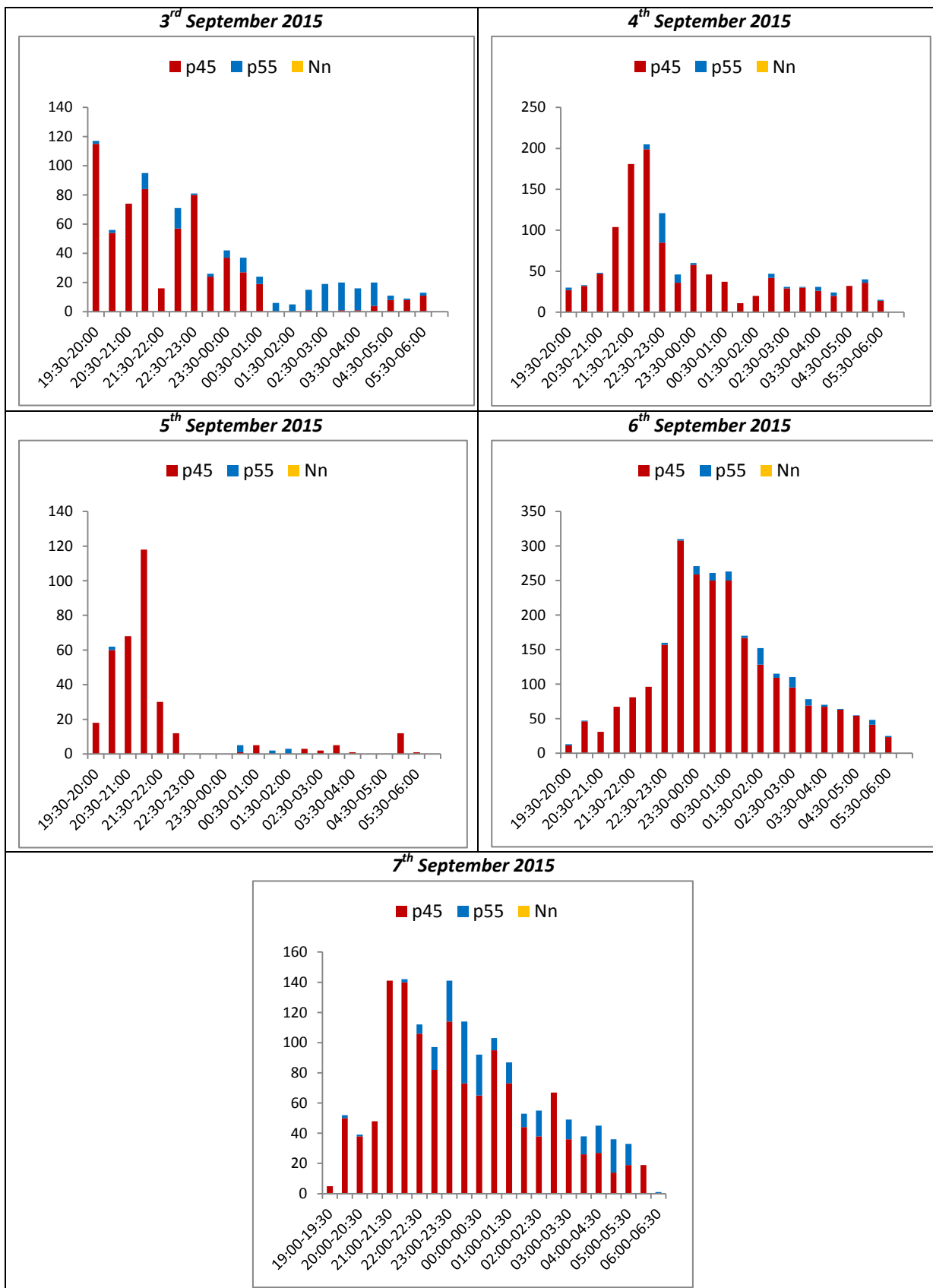
**10<sup>th</sup> May 2015**



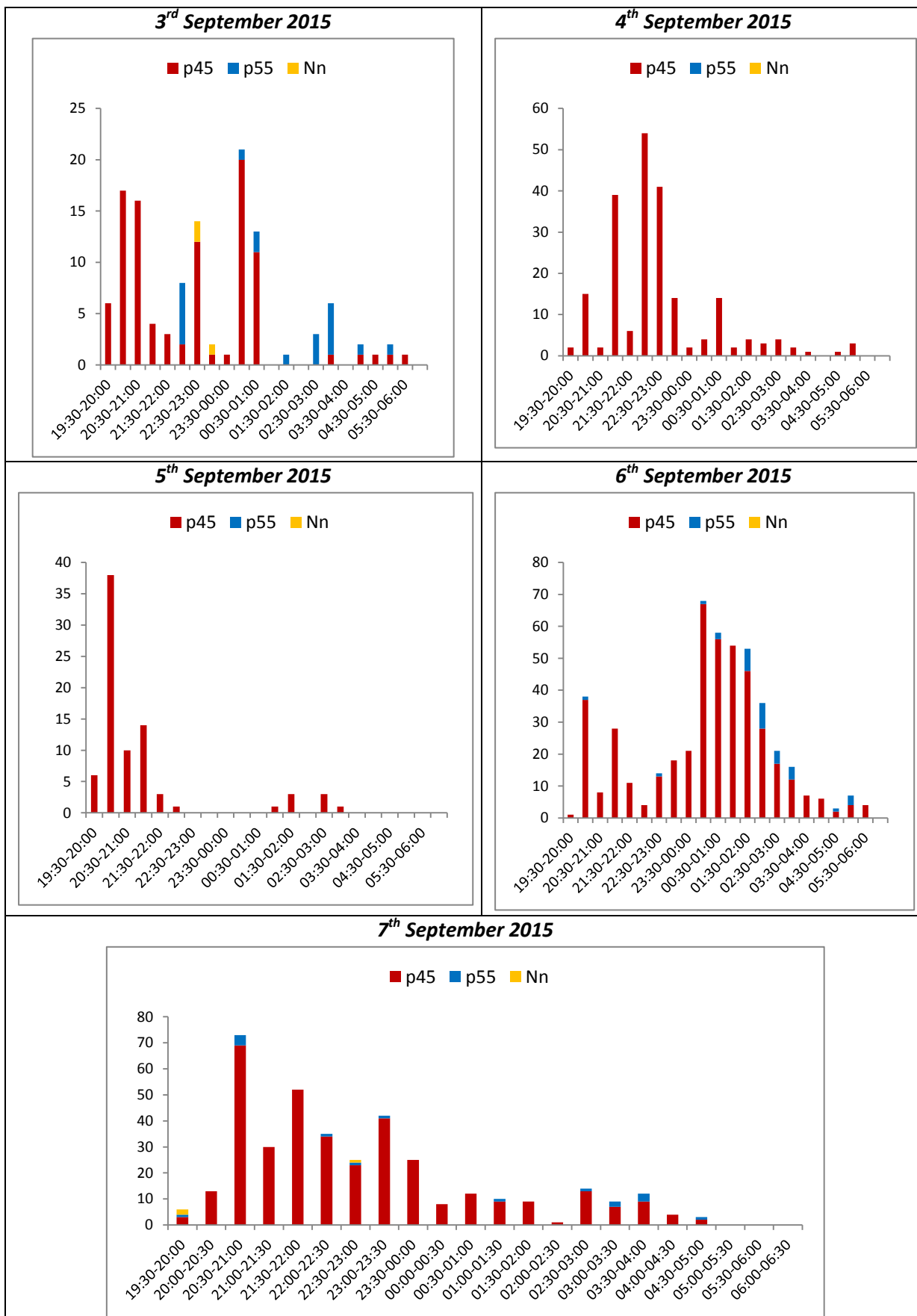
Static Detector D4 SW corner of the site by T13 and T14 – TQ34706 74108 - 8<sup>th</sup> to 11<sup>th</sup> May 2015



Static Detector D5 – north-east corner of the site (TQ34674 74211) – 3<sup>rd</sup> to 8<sup>th</sup> September 2015



Detector D6 – Located along the western boundary opposite T11 TQ34655 74159 – 3<sup>rd</sup> to 8<sup>th</sup> September 2015



Detector D7 –Clearing towards the central part of the site TQ34692 74147 – 3<sup>rd</sup> to 8<sup>th</sup> September 2015

