E C O L O G I C A L R E P O R T

Preliminary Bat Survey - Oxford Flood Alleviation Scheme (FAS)

Prepared for

Environment Agency

November 2016

One Kingsway
Cardiff
CF10 3AN
Wales

Contents

Document Summary

CH2M has been commissioned by the Environment Agency to undertake a Preliminary Bat Survey to inform the potential alignments of a western conveyance route as part of the Oxford Flood Alleviation Scheme (FAS). The Oxford FAS is critical in reducing the long-term risk of flooding to residential and commercial properties in the floodplains surrounding Oxford.

Preliminary bat inspections of the site undertaken to facilitate this report, have noted 10 structures and 49 trees supporting potential roosting habitat for bats. The preliminary surveys also identified several habitat features, namely woodland blocks, water ways and tributaries and species rich grasslands which are likely to support foraging and commuting habitat for bats.

As such, this report illustrates the location of these key features and provides guidance for further surveys and mitigation which should be incorporated into the project design, construction and operational phases to minimise impacts to bats.

No Special Areas of Conservation (SACs), designated for bats have been identified within 30km of the scheme extents and no Sites of Special Scientific Interest (SSSIs), designated for bats, have been noted within 5 km of the site. As such no recommendations are made for assessment of the project with respect to a designated features or Annex II bat species. Should such species be identified as a result of the further surveys recommended in this document then this status may need to be revaluated.

Some of the follow-up work recommended in this report has been carried out during the 2016 survey season (see section 4.4); this is reported separately.

Acronyms and Abbreviations

EPS	European Protected Species
NE	Natural England
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest

SECTION 1

Introduction

Oxford has 4,500 properties at a 1% or higher risk of flooding each year. This number could rise to nearly 6,000 by the year 2080 with the predicted effects of climate change. Major roads, the railway line, schools and businesses could also be affected by flooding.

The Oxford Flood Risk Management Strategy, published in 2009, produced a detailed study of the flood risk from rivers in Oxford. The Strategy described how flood risk can be managed in Oxford over the next 100 years, in 3 phases.

The first phase included asset repairs and maintenance, and was completed in 2012.

The principal components of the scheme, which is the second phase of the Strategy, are improvements to approximately 4.5km of the floodplain to the west of Oxford to better manage flood water away from properties. This may also be augmented by improvements to approximately 1km of other channels.

Although the full scope and extent of the scheme is yet to be finalised, it has the potential to result in impacts to features used by bats. As bats are a European Protected Species (EPS), adverse impacts upon their status need to be avoided. This report illustrates the location of key features, which may support bats, within the schemes likely zone of influence and it provides guidance for further surveys and mitigation which should be incorporated into detailed project design, construction and operational phases to minimise impacts to bats.

1.1 Legislation

All bat species in the UK are legally protected, both by domestic and international legislation.

The legislation makes it an offence to:

1. Deliberately capture, injure or kill a bat;
2. Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
4. Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; and
5. Intentionally or recklessly obstruct access to a bat roost.

Barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), Greater horseshoe (*Rhinolophus ferrumequinum*) and Lesser horseshoe (*Rhinolophus hipposideros*) bats are further protected, being listed on Annex II of the Habitats Directive which allows Special Areas of Conservation (SACs) to be designated for their presence. Projects or proposals which have the potential to adversely impact upon these designated sites should be screened and a determination of their likely impacts produced.

1.1.1 Conservation Status

Fourteen species of bat have been recorded in Oxfordshire. Each of these species and their likely distribution and range in Oxfordshire and the UK are illustrated in Table 1, overleaf.

Table 1
Conservation Status of Bats within Oxfordshire (Source: Oxfordshire bat group)

Species/Group	Species status and distribution in the UK	Species distribution in Oxfordshire
Common pipistrelle *Pipistrellus pipistrellus*	Common pipistrelle is widespread and common throughout Europe and the UK. Pipistrelle populations declined dramatically in the twentieth century. Their reliance on buildings for roosting makes them vulnerable to building development and renovation, exclusion and toxic timber treatments. Although maternity roosts for this species are commonly found in buildings, they will also readily use trees and have often been noted in riverside willows, alders and ash.	Widespread throughout the county.
Soprano pipistrelle *Pipistrellus pygmaeus*	Soprano pipistrelle is widespread and common throughout Europe and the UK. Pipistrelle populations declined dramatically in the twentieth century, almost certainly at least partly due to agricultural intensification. This species is strongly associated with water and factors affecting the quality of these habitats may also affect populations of Soprano pipistrelle. Its reliance on buildings for roosting makes it vulnerable to building development and renovation, exclusion and toxic timber treatments. Soprano pipistrelle, like Common pipistrelle will also readily use trees.	Widespread throughout the county.
Nathusius' pipistrelle *Pipistrellus nathusii*	Nathusius' pipistrelle appears to be widespread but rare across the UK with a peak in numbers during the late summer/early autumn migration period. As this is a strongly migratory species, it is likely to be at particular risk of collisions with wind turbines if these occur along its migratory routes. Maternity roosts are in buildings and trees, which are vulnerable to development and inappropriate land management. Other pressures include loss of habitats such as riparian, wetland, woodland and unimproved grassland.	Scarce widespread, including migrants.
Daubenton's Bat *Myotis daubentonii*	Daubenton's bat is widespread throughout Europe and the UK. Factors affecting water quality, riparian habitats including the availability of roosts in trees and artificial structures in these habitats, and underground hibernation sites could all affect populations of this species.	Widespread and fairly abundant throughout county.
Natterer's Bat *Myotis nattereri*	Natterer's bat is widespread throughout Europe and the UK. The increasing trend in barn conversions may have an impact on this species by reducing roosting opportunities. Remedial timber treatment in older buildings also needs to be carefully monitored to minimise impacts on populations of Natterer's bats.	Generally scarce, widespread
Eptesicus-Nyctalus group	Noctule is a relatively widespread species in England and Wales. Noctule colonies are reliant on trees for roosting and are often found in dead trees or branches. Poor management or loss of suitable trees is therefore likely to affect noctule populations. Factors affecting areas of high insect abundance where this species feeds, for example near waterbodies or wetland areas may also have an impact on its populations.	Uncommon, widespread.
Brown long-eared *Plecotus auritus*	The brown long-eared bat is widespread in the UK and across Europe. It is often found roosting in buildings and may therefore be vulnerable to building development and renovation, exclusion and toxic timber treatment. Colonies may also be affected by the rise in barn conversions.	Widespread throughout the county.

	Brown long-eared bats are also one of the commonest woodland species and will readily roost in trees.	
Lesser Horseshoe *Rhinolophus hipposideros*	Rare, Wales and the south west.	Rare colonies in north and west of the county.
Serotine *Eptesicus serotinus*	Uncommon. Mainly south of a line from a line between the wash and south Wales.	Widespread though uncommon.
Bechstein's Bat *Myotis bechsteinii*	Very rare; southern and central England and Wales. English Section 41 priority species and IUCN Red list near threatened status.	Very rare, few records of the bat from north of the county.
Barbestelle *Barbastella barbastellus*	Very rare; southern and central England and Wales. English Section 41 priority species and IUCN Red list near threatened status.	Widespread though uncommon woodland roosting bat.
Brandt's bat *Myotis brandtii*	Found throughout England and Wales.	Uncertain, few in hand identifications.
Whiskered Bat *Myotis mystacinus*	Scarce though widespread	Uncommon, occasional roosts identified
Leisler's Bat *Nyctalus noctula*	Scarce though widespread	Uncommon though widespread, few known roosts in the west, centre and north of the county

1.2 Aim

This report provides an assessment of features which may be used by bats within the likely extents of the FAS. It also provides an outline of the potential associated impacts of the proposed scheme on bats, whilst also providing guidance on further surveys and mitigation measures which can be implemented as part of the scheme design to minimise adverse impacts to bats.

1.3 Survey Area

The survey area includes the anticipated scheme extents as illustrated by the orange line in Appendix 1 of this document.

1.4 Desk Study

The data search, as obtained from the Thames Valley Environmental Records Centre (TVERC) in support of the Preliminary Ecological Appraisal - Phase 1 (CH2M, 2015 & 2016) for the project revealed no records of bats from within the proposed scheme footprint and no records of SACs within 30km of the site or SSSIs designated for bats within 5 km of the scheme extents.

SECTION 2

Survey Methods

This section details the methods used for the building, structure tree inspections and habitat evaluation carried out on the Oxford FAS between June and October 2016.

2.1 Preliminary Roost Assessment of Structures and Buildings

Preliminary Roost Assessments (PRA) consist of a detailed inspection of the exterior and where possible interior of a structure or building to look for features that bats could use for entry/exit and roosting and to search for signs indicative that bats may use the feature identified following interrogation of aerial photography or during an ecological walkover.

The aim of a PRA is to determine the actual or potential presence of bats and the need for further survey and/or mitigation, it allows each building or structure to be classified with respect to its potential roost suitability for bats as illustrated in Table 2.

Table 2
Criteria for Determining the Status of a Building or Structure with Respect to Bats (Source: Collins, 2016)

Roost Status	Description
Negligible	Negligible habitat features in building or structure likely to be used by roosting bats.
Low	A structure or building with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation)
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

2.2 Tree Inspections

A ground inspection of trees identified during the Preliminary Roost Assessment (2016) of the site was undertaken to identify trees hosting likely characteristic features (for example rot or woodpecker holes, hazard beams, cracks, fissures or dense ivy) that may support roosting bats. These assessments were undertaken by experienced ecologists from CH2M. The inspection was undertaken over several days with the ecologists systematically searching each tree with a torch and binoculars. Potential roost features (PRF) were then recorded for further inspection. Many of the trees on the site are already tagged, but where PRF were noted and a tag was not present a tag was added to aid identification.

2.3 Preliminary Habitat Assessment

The preliminary habitat assessment included an examination of aerial photography and a ground based examination of habitat types across the survey area to ascertain the sites suitability as a

forage and dispersal corridor for bats. The criteria used for determining the value of the site with respect to foraging and commuting bats is illustrated in Table 3.

Table 3
Criteria for Determining the Status of Habitat with Respect to Bats (Source: Collins, 2016)

Roost Status	Description
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.4 Survey Equipment, Personnel and Timings

The surveys were undertaken by Harriet Webb, between June and October 2016. Harriet is a chartered Ecologist and a member of CIEEM and has over 15 years' experience in undertaking bat surveys. The assessments employed the use of a torch, camera, close focusing binoculars, tree tags and a hammer.

2.4.1 Data Analysis

All tree surveys resulted in the production of annotated field maps and forms noting potential roosting features.

2.4.2 Limitations

Tree surveys are reliant on the identification and inspection of potential bat roosting features, bats however are cryptic species and may not always use specific features. Inspections can also be limited when safe access to a tree may not be feasible for example if the tree is overhanging a water course or rail corridor.

Many of the structures are bridges spanning water courses, accordingly their elevated location and position over a water course often means that full site access was restricted.

Bats can use a variety of habitat types including those in a highly urban environment, accordingly it is only possible to identify those habitat features that are likely to be of greatest value to foraging and commuting bats.

SECTION 3

Results

This section details the results of the bat surveys undertaken to facilitate the proposed scheme between June and October 2016.

3.1 Preliminary Tree Inspections

The survey identified 49 trees of varying species, age and maturity with potential roost features (PRF), the results of these surveys and the resulting recommendations for each of the trees is included in Appendix 2 of this document (locations within maps of Appendix 1).

One area, shown on Map 5 in Appendix 1 and illustrated in Figure 1 below, was not accessible at the time of the survey, due to its location between the river, road and rail corridors. It is recommended that this area be subject to further inspection by an experienced bat worker, should vegetation removal or increased levels of noise and vibration be anticipated as a result of the proposed works. Such an assessment will require special access consent from network rail as it lies adjacent to the operational corridor. Boat access may also be required for some of the trees. Felling works were underway in this location at the time of surveys and so access was not permissible during the survey window.

Figure 1. Area not surveyed

3.2 Preliminary Inspections of Buildings and Structures

Ten buildings and structures (locations within maps of Appendix 1) were identified as part of the preliminary roost inspection, of these structures 8 are regarded to have moderate potential roosting habitat for bats and 2 are regarded as having low or negligible potential for bats.

Structures with **moderate** potential habitat for roosting bats are:

1. Botley Road
2. 1 West Way Richer Sounds Building
3. Stone Bridge, North Hinksey Village
4. Footbridge Devils Backbone
5. Abingdon Road Bridge (Red Bridge)
6. Redbridge Hollow (Track) Bridge
7. I Southern Bypass Bridge over the rail corridor and Hinksey Stream
8. J. Railway Bridge over water course North of Kennington Junction.

A series of flood arches north of the stone bridge at Hinksey and a concrete road bridge carrying the A423, southern Bypass over Kennington Road were the only structures identified to have low potential roosting habitat for bats in the area surveyed.

Results of each of the surveys are summarised in Appendix 3.

3.3 Preliminary Habitat Assessment - Commuting and Foraging Habitats

A variety of continuous features across the site are considered to support habitat of **high value** to commuting and foraging bats such features include:

- River and stream corridors of South Hinksey Stream, the nearby River Isis/Thames and its tributaries and ditches.
- Blocks of woodland, particularly that running along the rail and riverine corridor.
- Open grazed meadows bordered by waterways and tree lined corridors.
- Treelines pathways, particularly that along Willow Walk and the Devils back.
- The allotments and gardens along Hinksey Lane.

SECTION 4

Evaluation, Impacts and Recommendations

This section presents an initial evaluation of the site based on the results of the bat surveys. The results and indicative evaluation have been used to provide a brief assessment of the likely ecological impacts of the proposed scheme to bats and the measures which will need to be implemented as part of the scheme to avoid any adverse impacts to bats.

4.1 Evaluation

The site supports a number of structures, buildings and trees, which have **moderate** potential to support roosting bats, as well as variety of continuous features, likely to be of **high** value to commuting and foraging bats.

No known roosts or critically endangered species have been recorded from the locality, as such it is likely that the site is of local or county importance to bats. Further surveys, will however, be required to support this assessment.

4.2 Potential Impacts of Proposed Works

The likely impacts of the proposed scheme with respect to bats are likely to be two fold. Flood alleviation schemes can have both positive and negative impacts. The creation of new channels can promote the development of ecologically diverse habitats of value to bats. However, in order to establish such habitat, tree and vegetation clearance maybe necessary. Such impacts have the potential, if unmitigated, to reduce available foraging and commuting habitat and kill or injure bats using the site. Impacts such as these can cause both short and long term impacts to bats.

Furthermore, the loss or modification of trees and structures to facilitate the works could result in the reduction and loss of roosting habitat.

In addition, construction lighting, vibration, noise and human presence to facilitate the scheme has the potential to temporarily disrupt and sever forage and commuting corridors for bat species using the site.

If unmitigated these impacts could result in an **adverse impact** to bats using the site.

4.3 Recommendations

In order to mitigate for the loss of habitat likely as a result of the proposed works it is recommended that the following further bat surveys of the location be performed, this includes:

- A preliminary roost inspection of those trees not previously surveyed.
- An elevated inspection of trees of high to moderate potential by an experienced climber (carried out in 2016 – see section 4.4).
- Dawn and dusk emergence surveys of buildings and structures, listed as low to moderate bat potential to be affected by the proposed (commenced in 2016 and to be completed in 2017 – see section 4.4). No features of high potential roosting habitat were noted during the preliminary survey.
- A walked transect (or preferably a boat) activity survey of the scheme extent to include two survey visits per month (April to October), in appropriate weather conditions for bats to ascertain the location of important forage and dispersal zones that need to be protected during the scheme implementation. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period and three automated survey locations per transect, data for this automated locations should be collected on five consecutive nights per month (April to October) in appropriate weather conditions for bats.

- Consultation with the Oxfordshire Bat Group to ascertain any information in relation to local sites or areas of favourable interest with respect to bats. Contact details for the group are as follows: David Endacott, 27 Hedge Hill Road, East Challow, Wantage , Oxfordshire, OX12 9SD. Tel: 01235 764832. Email Info@oxfordshirebats.org

Mitigation to be incorporated into the scheme design should include the following:

- Seasonally restricted and staged clearance of vegetation to minimise loss of habitat during the active bat season (April to October) inclusive.
- The retention of mature broad-leaved woodland and structures or features to both maintain commuting routes and retain potential roosting features. Such measures should be incorporated into the landscape design for the project. Unavoidable losses of trees, woodland and scrub should be compensated for within the landscape design using native species appropriate to the locale. Replacement planting of mature trees requiring removal should be in the proportion 3:1.
- The retention of hedgerows and scrub. In the event that a feature cannot be retained it should be compensated in the landscape design with species of value to foraging bats. New or reinstated hedgerows should be a minimum of 3m wide and support a diversity of species favoured by bat forage insects. They should seek to maintain and reinforce habitat connectivity across the site.
- Where ditch or waterbody loss is unavoidable, new ditches should be created to compensate for these losses, the ditches should be a minimum of 2 m wide and seek to establish, if not improve the characteristics of those features to be lost. Hedgerow and scrub planting should be established along the edges of the waterbodies to maintain and enhance foraging corridors.
- Night working and construction lighting in the vicinity of trees, scrub, hedgerows, streams and ditches should be avoided. If such impacts cannot be avoided, they should be seasonally restricted to avoid the active bat period (April to October). Where seasonal restrictions are not possible, light sources should be directed away from flight pathways and roosts. Lux levels should be reduced and screening or cowling should be fitted to restrict lighted areas to the minimum to facilitate work.
- A European Protected Species (EPS) Licence should be sought to facilitate removal of any roosts. It is likely that this licence, which should be sought from Natural England, will include the requirement to establish a replacement roost and for works at that locality to be seasonally restricted to minimise the risk of animals being killed or injured.
- Where possible works which would directly impact upon a roost or potential roosting feature, the design should seek to retain these features.
  - Where it is not possible to retain a tree roost or potential tree roost such features should be soft felled in the winter months under the supervision of an experienced bat worker. The removal of confirmed roosts is only permissible under licence from Natural England. Replacement trees should also be planted to compensate for the loss of the trees and, temporary replacement bat roosts should be installed whilst planting measures mature. Such features should conform to published roost replacement guidance provided by the Bat Conservation Trust. As bats may use these features in the future they should be soft felled under the supervision of an experienced bat worker. Where any boughs with cavities are to be lost there should be consideration for the section felling to allow for features to be strapped onto the branches of retained trees.
  - Where it is not possible to retain a roost in a building or structure, a replacement roosts of equal value will need to be established within the vicinity of the feature to be lost, again the loss of any confirmed roost feature should only be undertaken, subject to a licence issued by Natural England. Works to such a feature may also need to be seasonally restricted to allow for different roost characteristics.

With this mitigation in place, it is considered that significant impacts to bats as a result of the proposed scheme can be avoided.

4.4 Follow-up Work

Some of the work recommended in this report has already commenced. At the time of writing the following further surveys have been undertaken with respect to bats:

- Preliminary Climbed Tree Inspections of 55 trees were undertaken on 23-24 August and 8 September 2016. These are reported separately. A number of trees were identified as needing dawn and dusk emergence and re-entry surveys and firm evidence of summer roosting was found in a small number of trees.
- Initial roost entry and re-entry surveys of structures were undertaken at the stone bridge on Willow Walk to the north of Hinksey School. No bats were observed exiting the structure, but the site evidently supports a commuting corridor for a number of bat species. Further surveys of this feature are planned for spring and summer 2017.

SECTION 5

References

Preliminary Ecological Appraisal and Phase 1 Report, CH2M (2015)

Preliminary Ecological Appraisal and Phase 1 Report, CH2M (2016) – Supplementary report.

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn), The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

Oxfordshire Bat Group, Oxfordshire Bats. Viewed online 26/10/2016 at http://www.oxfordshirebats.org/oxfordshire-bat-group.html

Appendix 1
Preliminary Bat Inspection Maps

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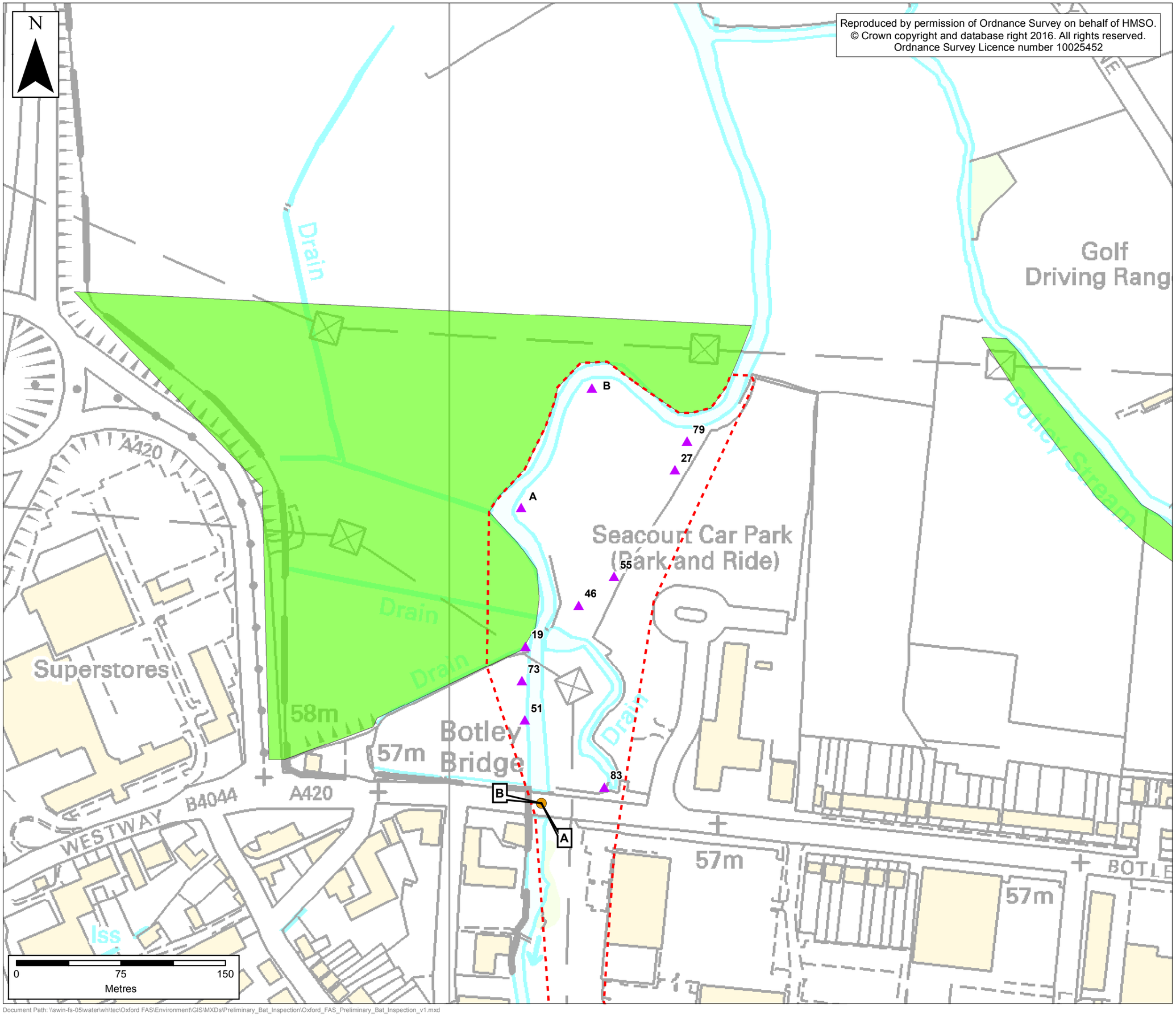

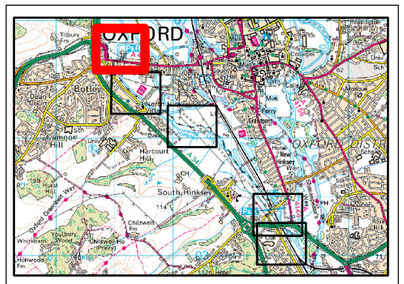

Legend

- Scheme Extents
- Access Restricted by Railway
- Tree bat potential, incidental result of other surveys
- Trees with Bat Potential as identified by the Phase 1
- Tree identified for further elevated/climbed inspection

Building or Structure Bat Roost Potential

- Negligible - Negligible habitat features in building or structure likely to be used by roosting bats.
- Low - A structure or building with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
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Rev	By	Chkd	Apprvd	Date	Description

Client

Environment Agency
Kings Meadow House
Kings Meadow Road
Reading
RG1 8DQ

CH2M HILL
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :

Oxford Flood Alleviation Scheme

Drawing :

Appendix 1: Preliminary Bat Inspection

Drawn By :	Martin Costello	Date: 20/10/2016
Checked By :	Harriet Webb	Date: 20/10/2016
Approved By :	Carolyn Francis	Date: 20/10/2016

Drawing No. : Map 1 of 5

Revision -

Drawing Scale : 1:2,500

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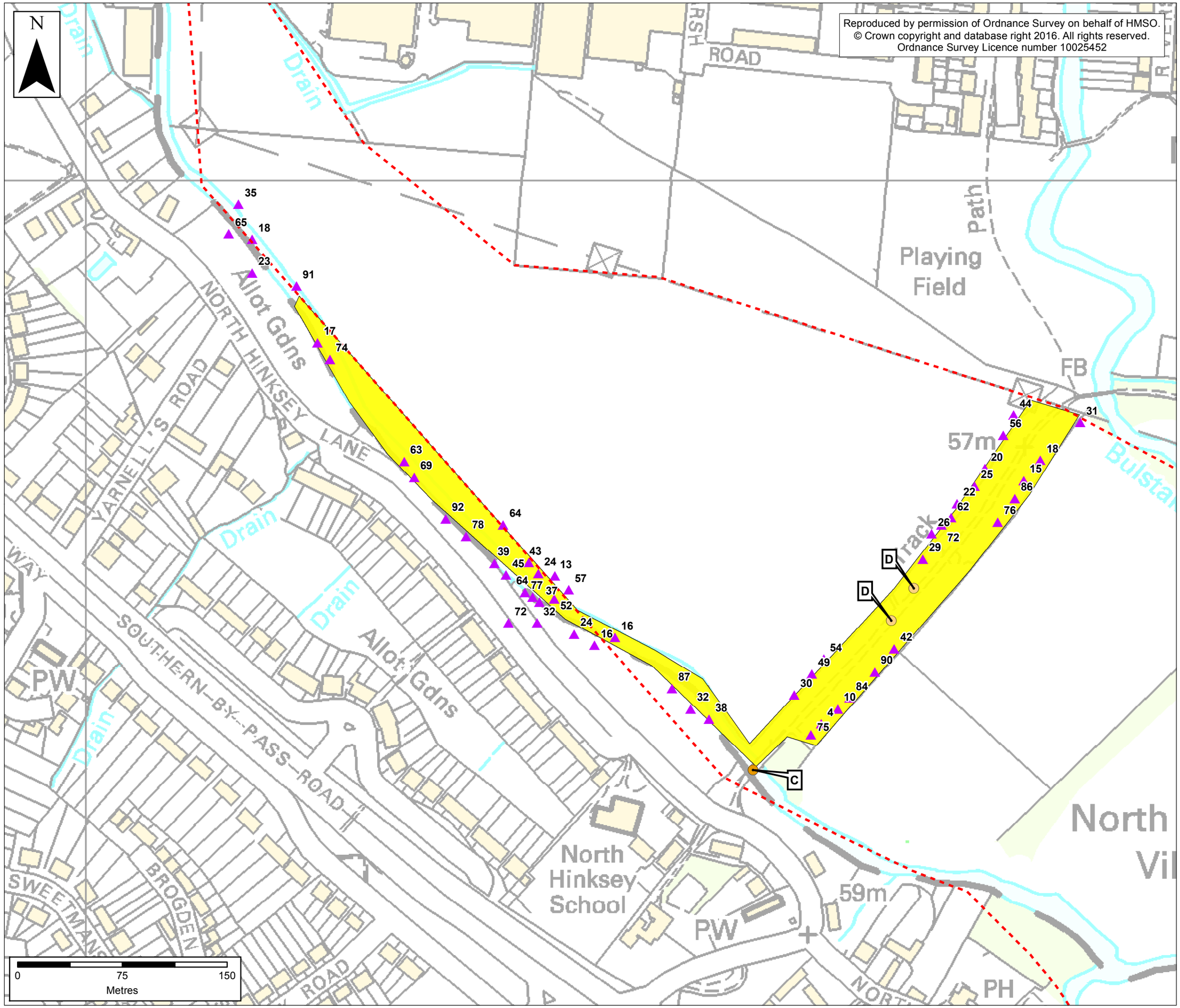

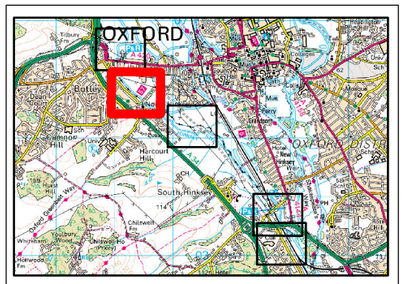

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Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
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Drawn By :	Martin Costello	Date: 20/10/2016
Checked By :	Harriet Webb	Date: 20/10/2016
Approved By :	Carolyn Francis	Date: 20/10/2016

Drawing No. : Map 2 of 5
Revision : -

Drawing Scale : 1:2,500

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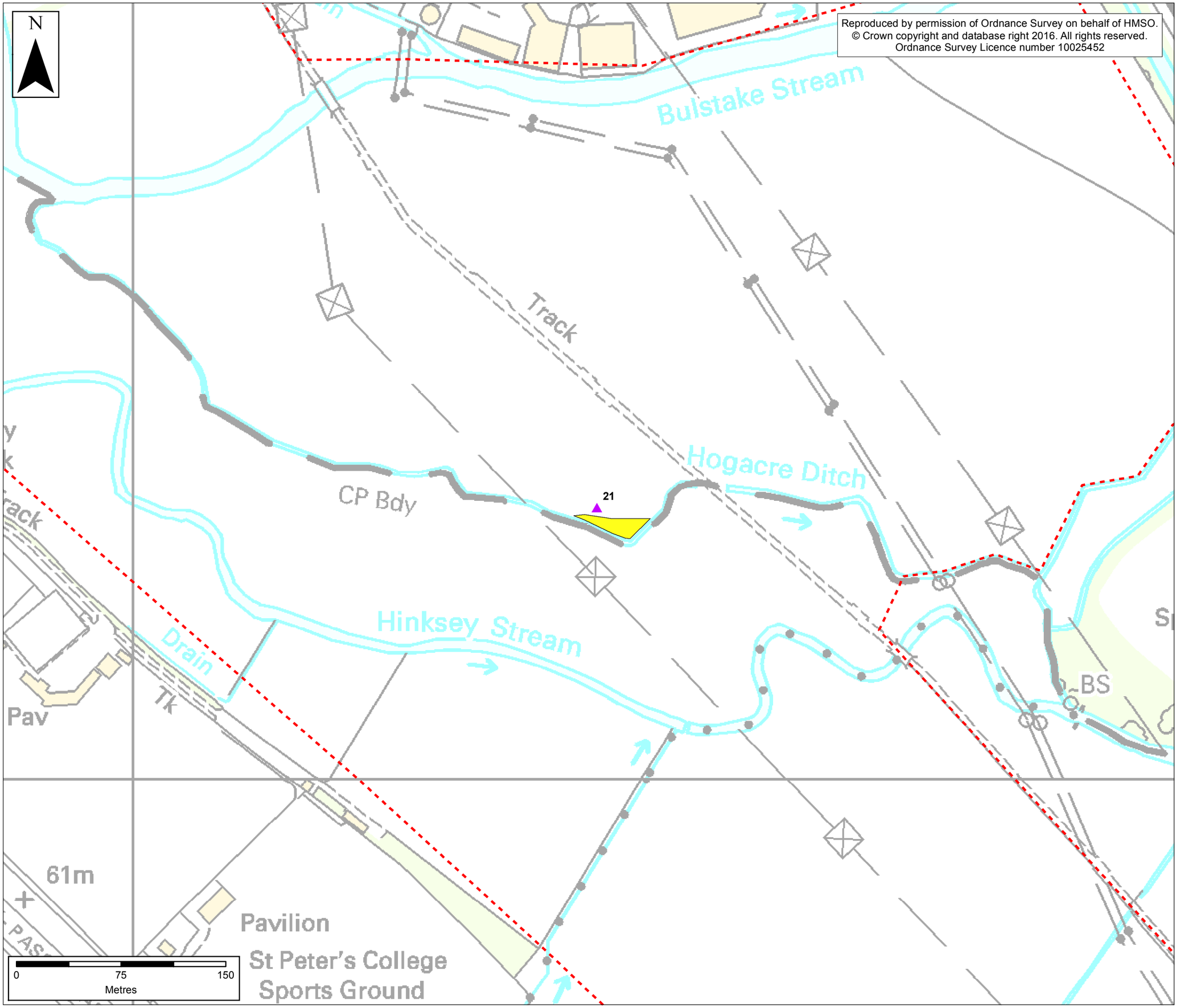

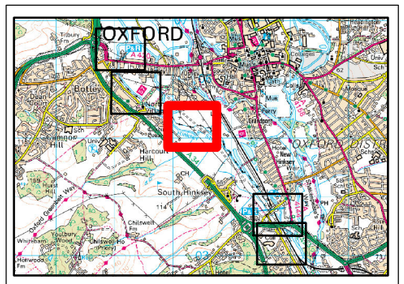

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- High - A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditionsa and surrounding habitat.

Rev	By	Chkd	Apprvd	Date	Description

Client
Environment Agency
Kings Meadow House
Kings Meadow Road
Reading
RG1 8DQ

CH2M HILL
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
Oxford Flood Alleviation Scheme

Drawing :
Appendix 1: Preliminary Bat Inspection

Drawn By :	Martin Costello	Date: 20/10/2016
Checked By :	Harriet Webb	Date: 20/10/2016
Approved By :	Carolyn Francis	Date: 20/10/2016

Drawing No. : Map 3 of 5
Revision -

Drawing Scale : 1:2,500

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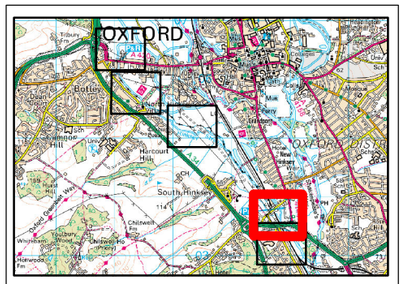

Legend

- Scheme Extents
- Access Restricted by Railway
- Tree bat potential, incidental result of other surveys
- Trees with Bat Potential as identified by the Phase 1
- Tree identified for further elevated/climbed inspection

Building or Structure Bat Roost Potential

- Negligible - Negligible habitat features in building or structure likely to be used by roosting bats.
- Low - A structure or building with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
- Moderate - A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
- High - A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditionsa and surrounding habitat.

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Drawn By :	Martin Costello	Date: 20/10/2016
Checked By :	Harriet Webb	Date: 20/10/2016
Approved By :	Carolyn Francis	Date: 20/10/2016

Drawing No. : Map 4 of 5
Revision -

Drawing Scale : 1:2,500

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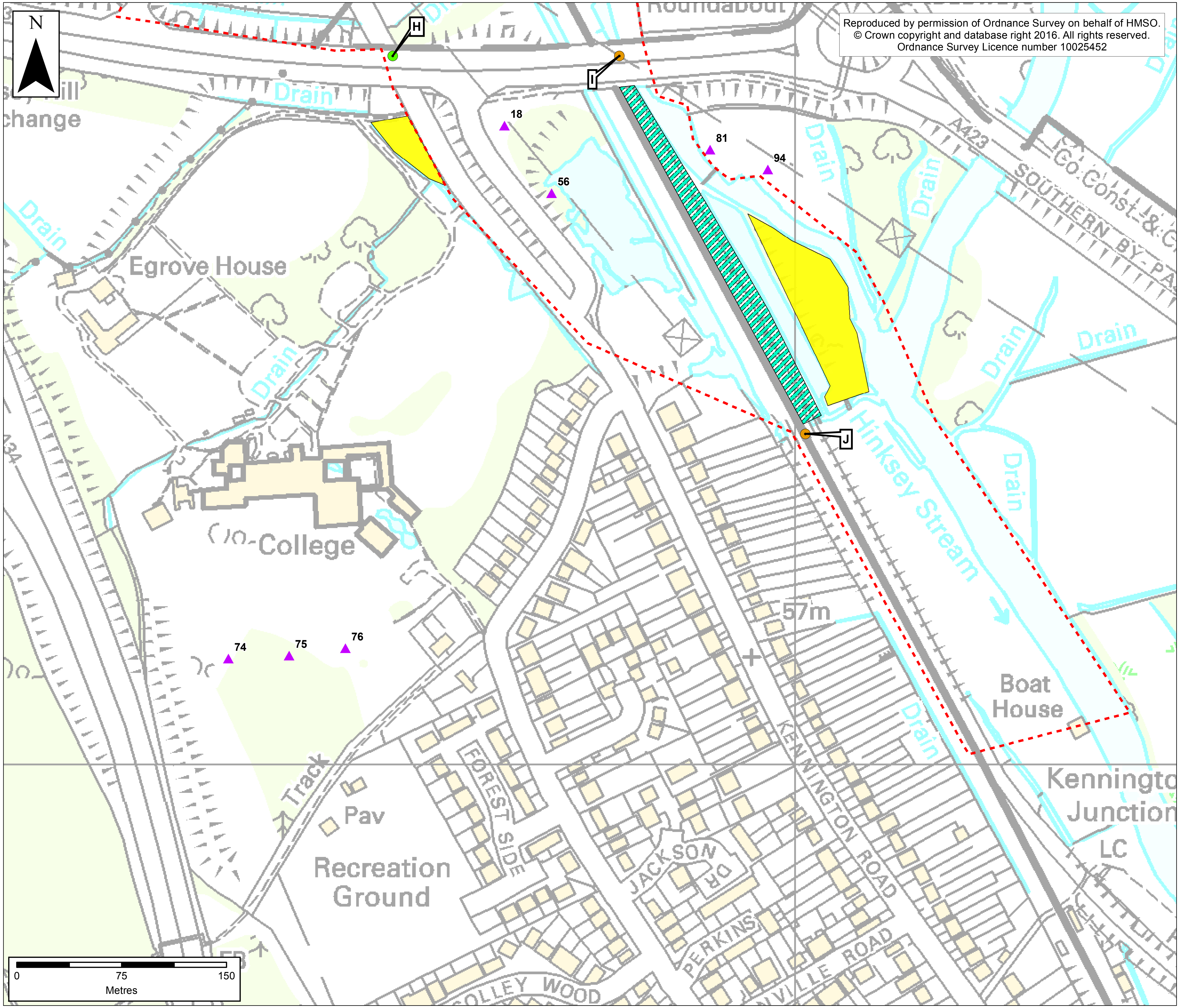

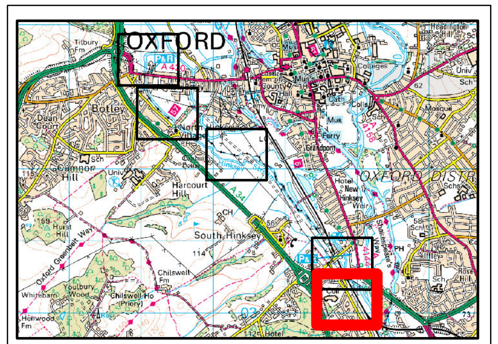

Legend

- Scheme Extents
- Access Restricted by Railway
- Tree bat potential, incidental result of other surveys
- Trees with Bat Potential as identified by the Phase 1
- Tree identified for further elevated/climbed inspection

Building or Structure Bat Roost Potential

- Negligible - Negligible habitat features in building or structure likely to be used by roosting bats.
- Low - A structure or building with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
- Moderate - A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
- High - A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditionsa and surrounding habitat.

Rev	By	Chkd	Apprvd	Date	Description

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Drawn By :	Martin Costello	Date: 20/10/2016
Checked By :	Harriet Webb	Date: 20/10/2016
Approved By :	Carolyn Francis	Date: 20/10/2016

Drawing No. : Map 5 of 5
Revision -

Drawing Scale : 1:2,500

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Appendix 2
Results of Preliminary Tree Surveys

Tree Potential Roost Features (PRF) Assessment

Project/Site Name:	Oxford FAS	Project Number:	661656

Name(s) of Surveyors: *(name of Lead Surveyor should be in **bold**)*	Lawrence Forgus **Harriet Webb**

Scope of works and likely impact to tree:
Works are yet to be reaslised but the locality is subject to a flood alleviations strategy which may require works to trees within the locality

Tree Details											
Date of Assessment	**Tag or ID No.**	**Tree Species**	**Description of location**	**Tree height**	**No of PRF observed**	**Tree Alive/Dead**	**Evidence of previous management (eg pruning, pollarding or coppice)**	**Surrounding Habitat**	**Description of PRF** *(eg woodpecker hole west side of tree at approx 5m, droppings and staining)*	**Comments** *(for example access problems, probable roost locations, evidence of bats, interaction with 3rd parties etc)*	**Recommendations for further survey protection during the works**
15-Jun-16	4	Willow	Public Footpath North of North Hinley School	20 mt	Multiple	Alive	Pollarding	Flood meadow, watercourse, footpath	Several split limbs with potential gaps for bats to access.	Adjacent to public footpath	Elevated inspection by a Bat Specialist
15-Jun-16	10	Willow	Footpath to New Botely, North of North Hinksey School	20 mt	Multiple	Alive	Pollarding	Flood meadow, footpath, watercourse, public footpath avenue of Willow	Split limbs & fungus (indicating potential decay)	On public footpath	Elevated inspection by a Bat Specialist
13-Jun-16	13	Willow	Footpath to New Botely, North of North Hinksey School	20 mt	Multiple	Alive	Pollarding	River corridor, meadow, local road, terraced houses	Multiple PRF on main stem/trunk. Several over 2m so inspection at ground level not possible.	Adjacent to watercourse	Elevated inspection by a Bat Specialist
15-Jun-16	15	Willow	Footpath to New Botley (Head North from North Hinksey School across stone bridge	20 mt	Multiple	Alive	Cut backs apparent	Flood meadow, watercourse, grazing	Multiple features	Along footpath	Elevated inspection by a Bat Specialist
14-Jun-16	16	Willow	Narrow strip between local road & river North Hinksey Rd	20 mt	Multiple		Difficult to ascertain due to delayed state but possible	River corridor, meadow, Local Rd	Split willow stem with one of the stems hanging across the river lots of PRF not accessible. Fungus growing out of fallen limb.	Potentially too dangerous to inspect by climber - needs climber to check over H_2O. Traffic management may be rquired for North Hinksey Lane?	Elevated inspection by a Bat Specialist
13-Jun-16	17	Crack Willow	Narrow strip between local road & river North Hinksey Rd	20m +	Multiple		Probably previously pollarded as part of river management	Meadow pasture & river corridor	Multiple PRFs on trunk (slightly too high to inspect from ground)		Elevated inspection by a Bat Specialist
15-Jun-16	18	Willow	Footpath to New Botley (Head North from North Hinksey School across stone bridge)	20 m +	Multiple	Alive	Yes, some outback of branches	Flood meadow, avenue of willow along footpath, watercourse, grazing pasture	Several features	Along public footpath	Elevated inspection by a Bat Specialist
13-Jun-16	19	Willow	On river corridor	20 m +	Several	Alive	Felling of limbs has taken place in past	RIver corridor	Hazard beam	Tree decaying state, limb has dropped onto adjacent tree	Elevated inspection by a Bat Specialist
14-Jun-16	23	Crack Willow	On river corridor	20 m +	Multiple	Alive	Yes, very heavily sided on allotment side	Allotments, river corridor	Multiple PRF, particularly on riverside	Arisings at base - not as difficult as adjacent tree but check with owner before as they might move! River corridor immediately adjacent	Elevated inspection by a Bat Specialist
14-Jun-16	24	Willow	On river corridor	20 m +	Multiple	Alive	Pollarding		Multiple split limbs, hazard beams. Hanging limbs	Maybe too hazardous to climb? - Get climber to check	Elevated inspection by a Bat Specialist
13-Jun-16	27	Willow	On river corridor adjacent to sea court. Park & ride marked on map.	20 m +	Multiple	Alive	Pollarding?	River corridor grazed pasture and park & ride car park	001 Fuji - Large willow on edge of river corridor. Visibility on river edge restricted - needs harnessed climber and life jacket 001 Nikon - Hazard Beam, East 1.3m 002 Nikon - Woodpecker hole, East 2.5m 003 Nikon - Cavity - Decay, North 2.5m	Access restricted to H_2O side of tree	Elevated inspection by a Bat Specialist
15-Jun-16	29	Willow	Footpath to now Botely, head North from North Hinksey on public footpath	20 m +	Multiple	Alive	Yes, branches appear to have been cut	Footpath. Avenue of willow. Flood meadow watercourse	Dead and broken limbs?	Adjacent to public footpath	Elevated inspection by a Bat Specialist
15-Jun-16	31	Willow	Footpath to New Botley (head North to North Hinksey School over stone bridge)	20 m +	Multiple	Alive	Yes - branches	Flood meadow, avenue of willow, watercourse, grazed pasture footpath	Thick Ivy covering, several broken branches with gaps	Adjacent to public footpath	Elevated inspection by a Bat Specialist
14-Jun-16	32	Willow	On edge of river in field. Opposite North Hinksey School	20m+	Multiple	Alive	Pollarding probable	S I field, river corridor	Multiple PRF - several at height or over river	Over watercourse. So life jackets, harness etc probably required	Elevated inspection by a Bat Specialist
13-Jun-16	13	Crack Willow	On edge of river in field. Opposite North Hinksey School	20m+	Multiple	Alive	N/A	Watercourse, allotments and meadow	Large crack willow, base decayed. Side overhanging watercourse. Not accessible	Access to riverside not possible. Inspection only possible by harnessed person or from boat in H_2O.	Elevated inspection by a Bat Specialist
14-Jun-16	37	Willow	On narrow bund between local road and river	20m+	Multiple	Alive	Pollarding?	Terraced houses, local road - not much light, river, meadow	Multiple PRF at height or over river corridor	Narrow working band between river and local road - TM?	Elevated inspection by a Bat Specialist
	38	Willow	On river corridor in field (SI)	20m+	Multiple	Alive	Pollarding	SI field. River corridor	Multiple PRF - Inspection from ground not possible	Adjacent to river corridor	Elevated inspection by a Bat Specialist
14-Jun-16	39	Willow	Between local road and river corridor	20m+	Multiple	Alive	Yes - 'siding' road side	River corridor, local road (poorly lit), terraced houses, meadow	Multiple PRF over 2m and on river corridor side which could not be inspected from ground.	Located on very narrow strip between local road and river corridor	Elevated inspection by a Bat Specialist

Tree Details											
Date of Assessment	**Tag or ID No.**	**Tree Species**	**Description of location**	**Tree height**	**No of PRF observed**	**Tree Alive/Dead**	**Evidence of previous management (eg pruning, pollarding or coppice)**	**Surrounding Habitat**	**Description of PRF** *(eg woodpecker hole west side of tree at approx 5m, droppings and staining)*	**Comments** *(for example access problems, probable roost locations, evidence of bats, interaction with 3rd parties etc)*	**Recommendations for further survey protection during the works**
15-Jun-16	42	Willow	Footpath to New Botely. Head North from North Hinskey school across stone bridge	20mt	Multiple	Alive	Yes - probable pollarding	Flood meadow, watercourse, footpath	Cavity just above tag. (needs endoscope to inspect)	Adjacent to public footpath	Elevated inspection by a Bat Specialist
16-Jun-16	43	Willow	Footpath to New Botely. Head North from North Hinskey school across stone bridge	20m+	Multiple on trunk	Alive	Yes, probably pollarding	River corridor, meadow, local road, terraced houses	Multiple PRF on trunk, several over 2m from ground or overhanging watercourse	Overhanging watercourse	Elevated inspection by a Bat Specialist
14-Jun-16	45	Willow	On narrow strip between local road and river corridor	20m+	Multiple	Alive	Yes, siding and appears to have been bashed recently	River corridor, terraced houses, Local Road - Limited	Multiple PRF - Several PRF not accessible from ground due to height or presence of river corridor	Between local road and river - Very narrow working gap	Elevated inspection by a Bat Specialist
13-Jun-16	46	Cracked Willow	On bend in river among group of willow	20m+	Multiple	Alive	Possibly some pollarding but minor	River corridor, pasture, national grid tower	Several broken branches/hazard beams. One directly over the watercourse		Elevated inspection by a Bat Specialist
	51	Willow	Adjacent to river corridor	3m stump 20m+ branches	Multiple	Alive	Heavily managed	River corridor, woodland and pasture	Multiple cavities and gaps in tree which appears to have fallen and twisted over	Difficult to access riverside	Elevated inspection by a Bat Specialist
13-Jun-16	52	Willow	Adjacent to river corridor	20m+	Multiple	Alive	Yes, pollarding some branch occlusion about	River corridor, meadow, terraced housing, local road	Multiple PRF on trunk of tree - typical willow decay and collapse overhanging river so not accessible from ground	Overhanging watercourse	Elevated inspection by a Bat Specialist
13-Jun-16	55	Crack Willow	On edge of swampy area, adjacent to river corridor in group of willow	20m+	2	Alive		Grazed pasture and river corridor	Woodpecker	Access restricted to watercourse side of the tree	Elevated inspection by a Bat Specialist
13-Jun-16	57	Willow	Adjacent to river corridor	20m+	Multiple	Alive	Yes, probable pollarding	River corridor, local road, terraced houses, meadow	Multiple PRF on main trunk - several over 2m so not possible to inspect from ground	Adjacent to watercourse	Elevated inspection by a Bat Specialist
13-Jun-16	63	Willow	Adjacent to river corridor	20m+	Multiple on trunk	Alive	Yes, several branches occluding	Watercourse, meadow, terraced houses	Multiple PRF on main trunk		Elevated inspection by a Bat Specialist
13-Jun-16	64	Willow	Adjacent to river corridor	20m+		Alive	Yes, pollarding our back branches occluding	River corridor, meadows, allotments, local road, terraced houses	Multiple features on trunk - cavities dur to decay, flaking bark	Adjacent to watercourse	Elevated inspection by a Bat Specialist
14-Jun-16	65	Willow	Adjacent to river corridor	20m+	Multiple		Yes, recently very heavily sided on now river side. Arrisings on ground	River corridor, allotments, meadow pasture and local road	Multiple PRF - Particularly on riverside	Access restricted by arrisings in front of tree and river at back. Will need to discuss/agree access with landlowner. Nesting birds appear to be using feature.	Elevated inspection by a Bat Specialist
	68	Willow	NNR adjacent to Red Bridge between watercourse and railway	20m+	Multiple			NNR adjacent to 'Red Bridge'	Multiple features, cavity presently appears to be being used by a nesting bird at present		Elevated inspection by a Bat Specialist
13-Jun-16	69	Willow	Adjacent to river corridor	20m+	Multiple	Alive	Yes, pollarding probable	River corridor, meadow, RD (local), terraced houses	Multiple on trunk but several at 2m+ will need climb or ladder inspection		Elevated inspection by a Bat Specialist
13-Jun-16	73 (Tag on broken limb)	Willow	Adjacent to river course	20m+	Multiple	Alive	Limbs on riverside appear to have been out back	River corridor , grazed pasture OHL	Cavity	Probable that climbed inspection is not feasible dur to decayed state of this tree. Branch of adjacent tree has fallen on to tree	Elevated inspection by a Bat Specialist
13-Jun-16	74	Willow	Adjacent to river corridor	20m+	Multiple	Alive	Yes, some limbs occluding following cut	Meadow and river corridor	Multiple PRFs on trunk - slightly to high to inspect - needs ladder or climbed inspection		Elevated inspection by a Bat Specialist
15-Jun-16	75	Willow	Adjacent to public footpath North Hinksey Schoolo	20m+	Multiple	Alive	Pollarding	Flood meadow, watercourse, public footpath avenue of willow	Split limbs and fungus		Elevated inspection by a Bat Specialist
15-Jun-16	75	Willow	Adjacent to public footpath North of North Hinksey School	20m+	Multiple	Alive	Pollarding	Flood meadow, watercourse, public footpath avenue of willow	Split limbs and fungus	Adjacent to public footpath	Elevated inspection by a Bat Specialist
15-Jun-16	76	Willow	Footpath to New Botley, head North from North Hinksey School across stone bridge	20m+	Multiple	Alive	Yes, cut back limbs	Flood meadow, watercourse, footpath	Multiple features, woodpecker hole, split limb	Adjacent to public footpath	Elevated inspection by a Bat Specialist
14-Jun-16	77	Willow	Narrow strip between local road & river corridor	20m+	Multiple	Alive	Yes, from local road side	River corridor, meadow, Local road, very little lighting, terraced houses	Multiple PRF at height or on riverside which could not be inspected safely	Narrow working strip between local road and river	Elevated inspection by a Bat Specialist
14-Jun-16	78	Willow	Adjacent to river corridor	20m+	Multiple	Alive	Yes, pollarding and siding on local road side	River corridor, local road - limited lighting terraced housing meadow	Multiple PRF - features over 2m need to be inspected as height as do features on river side		Elevated inspection by a Bat Specialist
13-Jun-16	79	Willow (Crack)	On river corridor adjacent to sea court park and ride car park	20m+	Multiple		Pollarding ?	River corridor, grazed pasture, park & ride	Not able to access view PRF on river side, will require harness/life jacket Cavity at 1m extending 1-2m up East side of tree Cut stem decaying on east side of tree	Access restricted to watercourse side of the tree	Elevated inspection by a Bat Specialist
15-Jun-16	81	Willow	South of Kennington roundabout in small woodland adjacent to watercourse	20m+	Multiple (covered by ivy)	Alive	Yes, cut back apparent	A423, railway, woodland, OHL, water corridor	Thick my obscuring trunk and upper branches	Over watercourse can be accessed by climbing down parth from A423	Elevated inspection by a Bat Specialist
13-Jun-16	83	Crack Willow	Adjacent to car park & ride outrage	20m+	1 but probable others		Pollarding and limb removal	River corridor and park & ride	Dombie Stem Cavity - Possibly wood pecker excavated knot	Dead and decaying areas may make a climb difficult. Adjacent to car park distance side gate	Elevated inspection by a Bat Specialist

Tree Details											
Date of Assessment	**Tag or ID No.**	**Tree Species**	**Description of location**	**Tree height**	**No of PRF observed**	**Tree Alive/Dead**	**Evidence of previous management (eg pruning, pollarding or coppice)**	**Surrounding Habitat**	**Description of PRF** *(eg woodpecker hole west side of tree at approx 5m, droppings and staining)*	**Comments** *(for example access problems, probable roost locations, evidence of bats, interaction with 3rd parties etc)*	**Recommendations for further survey protection during the works**
15-Jun-16	84	Willow	Footpath to New Botley, head North from North Hinksey School	20m+	Multiple	Alive	Pollarding	Flood meadow, watercourse, footpath	Multiple features	On public footpath	Elevated inspection by a Bat Specialist
15-Jun-15	86	Willow	Footpath to New Botley - Head North from North Hinksey School over stone bridge	20m+	Multiple	Alive	Yes	Flood meadow, Avenue of willow trees, watercourse, footpath	Multiple features	Along public footpath	Elevated inspection by a Bat Specialist
14-Jun-16	87	Willow	In field adjacent to river opposite South Hinksey School	20m+	Multiple	Alive	Pollarding ?	SI Field and river corridor	Multiple PRF at height and adjacent to watercourse so could not be inspected from ground	Adjacent to river corridor, as such life jacket harness etc will be required for survey	Elevated inspection by a Bat Specialist
	89	Willow	Adjacent to railway corridor in local nature reserve	20m+	Multiple	Alive	Yes, some branches appear to have been lopped	LNR, watercourse and railway corridor	Cavity at approximately 1.5m needs endoscope inspection	Can be accessed from gate into LNR on Kennington Road	Elevated inspection by a Bat Specialist
13-Jun-16	91	Willow	On edge of river corridor	20m+	N/A	Alive	Yes, branches occluding	Meadow and river corridor, opposite bank allotments	Visibility on opposite side restricted by river corridor need harness or boat if inspection from opposite bank not feasible		Elevated inspection by a Bat Specialist
14-Jun-16	92	Willow	Adjacent to river corridor	Yes, Pollarding	Multiple	Alive	Yes, Pollarding	River corridor, local road (low level lighting). Terraced houses meadow	Multiple PRF, several over 2m so not accessible from ground	Adjacent to river and local road	Elevated inspection by a Bat Specialist
15-Jun-16	94	Willow	South of kennington roundabout in small woodland adjacent to watercourse	20m+	Multiple	Alive	Evidence of 'homeless' person habiting	A423, railway corridor	Thick ivy covering large tree with several PRF	Appears that a 'homeless' person has constructed a shelter under this tree. They were not present at the time of survey but may cause a hinderance if present	Elevated inspection by a Bat Specialist
	Tag A	Willow	On bond in river corridor, marked as A on plan	20m+	Multiple	Alive	N/A	River corridor pasture			Elevated inspection by a Bat Specialist
	Tag B	Willow	On river corridor	20m+		Alive		Pasture and river corridor			Elevated inspection by a Bat Specialist

Appendix 3
Results of Preliminary Structures Survey

Appendix 3

Results of Preliminary Structures Survey

Name of structure or building	Description & Access Details	Suitability for bats	Recommendations for further surveys
A. Botley Road 	Concrete Road bridge over the River Isis to the south of Sea Court Car park located at Grid reference: SP 49066 06299. Operated by Oxford Council Highways Department. County Hall, New Road, Oxford, OX1 1ND. Tel. Access to the south of this feature is restricted and will be required by boat or access from 3rd party land ("Richer Sounds" building see below). Access to the north of the structure can be achieved from the road corridor. Work adjacent to water course will require applicable safety precautions life jacket throw rope etc.	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted by features river corridor position.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by two surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured.
B. 1 West Way Richer Sounds Building 	Brick and timber framed building with a tiled pitched roof immediately adjacent to the river corridor. Several gaps and crevices providing suitable roosting habitat noted on river side of building. Operated by Richer Sounds, 1 West Way, Botley Road, Oxford. OX2 0JB. Tel: 0333 900 0052. Grid Reference: SP 49066 06299.	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted as property owner was on holiday.	Should works to this building be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. A minimum of 3 surveyors will be required to adequately survey this structure.
C. Stone Bridge, North Hinksey Village 	A stone and brick bridge which carries a public right of way (Willow Walk) over Hinksey stream. Operated by Oxford Council Highways Department. County Hall, New Road, Oxford, OX1 1ND. Tel. Access to the south of this feature is restricted and will be required by boat or access from 3rd party land Work adjacent to water course will require applicable safety precautions life jacket throw rope etc. Grid Reference: SP 49477 05578	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted to those arches on dry land.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by two surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured. Positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured.
D. Flood arches north of stone bridge 	Concrete flood arches under public right of way. Located to the north of the stone bridge. Grid Reference: SP 49576 05685 and SP 49592 05708	**Low** Low number of potential roost sites but good surrounding habitat meaning use as a roost feature is potential. No evidence of bat use noted during inspection but inspection restricted for arches of the bridge over the river corridor.	

Appendix 3

Results of Preliminary Structures Survey

Name of structure or building	Description & Access Details	Suitability for bats	Recommendations for further surveys
E. Footbridge Devils Backbone 	Footbridge carrying Public Right of Way over Hinksey Stream Grid reference: SP 51182 04454	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted to those arches on dry land.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by two surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured.
F. Abingdon Road Bridge (Red Bridge) 	Local Authority Road Bridge carrying Abingdon Road over stream. Operated by Oxford Council Highways Department. County Hall, New Road, Oxford, OX1 1ND. Tel. Grid Reference: SP 51652 03701	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted due to elevated height and water corridor.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by two surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured.
G. Redbridge Hollow (Track) Bridge 	Stone and concrete bridge carrying access track over stream. Grid Reference: SP 51636 03717	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted due to water corridor.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by two surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured.
H. Kennington Road, Southern bypass overbridge	Road bridge carrying the A423 over Kennington Road. Grid reference: SP 51712 03506	**Negligible** Inspection of structure revealed no features likely to support high numbers of roosting bats and no evidence of habitation by bats. The feature is also lit by overhead lighting from the A423.	No further recommendations, but should bats be found as an incidental result of the works, then works should cease and the advice of an ecologist sought. Expansion joints are sealed and considered to be inaccessible to bats.

Appendix 3

Results of Preliminary Structures Survey

Name of structure or building	Description & Access Details	Suitability for bats	Recommendations for further surveys
			
I Southern Bypass Bridge over the rail corridor and Hinksey Stream 	Concrete Road Bridge Carrying Southern bypass A423 over rail corridor and Hinksey Stream Grid reference: SP 51874 03506	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted due to water corridor.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by four surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured. Access to the site is restricted by the rail corridor.
J. Railway Bridge over water course North of Kennington Junction 	Rail bridge carrying railway over tributary to Hinksey Stream. Access restricted by live railway corridor. Grid Reference: SP 52007 03236	**Moderate** Several gaps and crevices in structure which could be utilised by bats due to their size, protection and surrounding riverine corridor. No evidence of bat use noted during inspection but inspection restricted due to water corridor.	Should works to this bridge be required as part of the project, particularly those that would alter the underside of the structure over the river corridor or which would result in increased levels of light, noise or vibration or exposure to higher water levels, then it is recommended that two separate emergence/re-entry survey visits. One dusk emergence and a separate dawn re-entry survey, be undertaken between May and September with at least one of surveys between May and August. The surveys should be undertaken by four surveyors positioned either side of the bridge and ideally on a boat or pontoon so that their view of the structure is not obscured. Access to the site is restricted by the rail corridor.