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National Archives

Ecological Walkover Survey Report

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Contents

1 Introduction

1.1 Background

Jacobs Engineering UK Ltd. has been commissioned to undertake an Extended Phase 1 Habitat Survey of the National Archives site in Kew, London Borough of Richmond upon Thames. The survey is required to map the habitats found on the site as well as to assess the potential presence of legally protected species and any other notable habitats and species. The results of this survey will be used to inform the production of a site Biodiversity Action Plan (BAP) which will be produced separately to this report.

1.2 Site description

The National Archives site is located in Kew, London Borough of Richmond upon Thames, at Ordnance Survey grid reference TQ195772. The site is bounded by the River Thames to the north and east, a railway line to the west and residential housing to the south. The site is well maintained and supports two large buildings, areas of hardstanding, ornamental shrubs, short grassland and ponds; the majority of the site is fully accessible to the public and National Archives staff.

2 Methodology

2.1 Field survey

An Extended Phase 1 Habitat survey was undertaken by a suitably qualified and experienced ecologist on the 18th August 2010 in accordance with the guidelines provided in the *Handbook for Phase 1 Habitat Survey – a technique for environmental audit* (JNCC, 2003). All habitats within the National Archives site were mapped and the dominant plant species present in each habitat recorded. Target note descriptions were also recorded for features of nature conservation importance.

The survey also included an assessment of the habitats and features found within the site boundary for their potential to support legally protected and/or notable species and habitats.

2.2 Bat inspection

An internal and external inspection of the two main buildings (Q1 and Q2) on the site was undertaken to identify the potential for and/or presence or likely absence of bats. The external inspection involved a visual assessment of each building from the roof and ground level (using close-focussing binoculars) to identify the presence of features that could be utilised by bats, including:

- cracks and gaps in damaged brickwork;
- gaps below hanging tiles, roof slates, weatherboarding or soffit boxes;
- air vents, drainage pipes and other cavities.

Each inspection also aimed to identify evidence that indicates bat presence in the buildings, notably:

- droppings;
- feeding remains;
- urine or fur staining;
- live bats; and,

- bat carcasses.

The general suitability of all potential roost features and adjacent habitats for bats was also assessed and recorded during the survey.

2.3 Constraints

The survey was undertaken during calm, dry weather conditions with scattered cloud and a maximum temperature of 22° Celsius.

Late August is a sub-optimal period for undertaking a Phase 1 Habitat Survey as many species of flora have finished flowering and may not be evident at this time of the year. However, due to the types of habitat found on the site, the timing of the survey is not considered to be a significant constraint and is not thought to have influenced the validity of the survey results.

Full access to each of the buildings was available and a thorough bat inspection was possible from the roof (building Q2 only), ground level and inside the buildings.

3 Results

3.1 Extended Phase 1 Habitat Survey

A habitat map and target notes describing the habitats recorded on site are provided in Appendix A.

Eight habitat types were recorded during the survey; parkland, species poor semi-improved grassland, amenity grassland, standing water, introduced shrubs, hedgerows, buildings and bare ground. A description of each habitat is provided below.

Parkland

The site supports a variety of scattered trees that are both semi-natural and plantation in origin. The majority of trees present are semi-mature and have been planted in association with ornamental shrub borders, boundary hedgerows and areas of amenity grassland. Of the species present, cherry *(Prunus sp),* whitebeam *(Sorbus aria)*, ash *(Fraxinus excelsior)* and sycamore *(Acer pseudoplatanus)* are abundant. Semi-mature horse chestnut *(Aesculus hippocastanum)*, English oak *(Quercus robur)* and *Acacia* trees are also occasional.

The margins of Pond 2 (see below) support semi-mature tree species comprising alder *(Alnus glutinosa)*, silver birch *(Betula pendula)*, goat willow *(Salix caprea)* and grey willow *(Salix cinerea)*.

Two cedar (*Cedrus sp.)* trees located near to the site entrance close to the southern boundary are the only fully mature trees on the site and are of local landscape value. Images 9 and 10 in Appendix B show these trees.

Species poor semi-improved grassland

All areas of grassland on the site were shortly mown at the time of survey. Although the grassland was generally managed as amenity space, the presence of herbs (although restricted in abundance and diversity) indicates that the majority of grassland can be classified as species poor semi-improved, as opposed to the less valuable ‘amenity’ grassland classification.

The dominant grass species in these areas is perennial rye grass *(Lolium perenne)* although the herbs yarrow *(Achillea millefolium)*, ribwort plantain *(Plantago lanceolata)*, daisy *(Bellis perennis)* and dandelion *(Taraxacum officinale ag.)* are abundant. The species mugwort *(Artemisia vulgaris)*, bird's-foot trefoil *(Lotus corniculatus)*, red clover *(Trifolium pratense)*, black medic *(Medicago lupulina)*, nettle *(Urtica dioica)* and charlock *(Sinapis arvensis)* are all occasional.

Images 2, 3 and 7 in Appendix B show some of the areas of grassland found on the site.

Amenity grassland

An area of short mown amenity grassland is located to the west of Pond 2. The area is set aside for use as a picnic site and also supports a number of young plantation trees.

Standing water

Two artificial ponds connected by a weir are present within the site. The source of water for the ponds was not confirmed during the survey although site staff indicated that the water levels were periodically topped up with mains water. Both ponds have concrete sides and are immediately adjacent to areas of hardstanding. No macrophyte vegetation (submerged, floating or emergent) was present in either pond although Pond 2 (refer to Figure 1) supports a small island with dense shrubs and a weeping willow *(Salix x sepulcralis)* tree. The banks of Pond 2 also support mature trees including alder, silver birch, goat willow and grey willow. A large algal bloom was present in Pond 1 at the time of survey.

During the survey, a single grey heron *(Ardea cinerea)* was observed on Pond 1 with coot *(Fulica atra)*, moorhen *(Gallinula chloropus)* and mallard *(Anas platyrhynchos)* recorded on Pond 2. Several coot or moorhen chicks were also present.

Photographs of the ponds and adjacent habitats are provided in Appendix B.

Introduced shrubs

The site supports extensive areas of ornamental shrubbery, notably alongside the main buildings, carparks and access roads. Species present include cotoneaster *(Cotoneaster sp)*, bamboo, yew *(Taxus baccata)*, dogwood *(Cornus sp)*, hebe *(Hebe sp)*, firethorn *(Pyracantha sp)* and privet *(Ligustrum sp)*.

Hedgerows

Much of the site boundary consists of well established hedgerows supporting a mixture of native species, including hawthorn *(Crataegus monogyna)*, ash, dogwood *(Cornus sanguinea)*, beech *(Fagus sylvatica),* hazel *(Corylus avellana)*, rose *(Rosa sp)*, English elm *(Ulmus procera)* and sycamore.

Buildings and bare ground

The site is dominated by two large buildings (Q1 and Q2) with several carparks, access roads, paving and footpaths making up the remaining 'hard' areas. A detailed description of the buildings is provided in section 3.2 below.

3.2 Bat inspection

3.2.1 Building description

The site supports two main buildings (Q1 and Q2), both located within 200m of the River Thames.

Building Q1 is a large, square, four storey, concrete building constructed in the 1970s, with a flat aluminium sheet roof (which was installed during the 1990s) and a large roof space. The building is in good structural condition.

Building Q2 is a modern glass and concrete building supporting a variety of roofs including pitched, hipped and mono-pitch styles. The roof material comprises a mixture of corrugated aluminium sheets, glass and tightly fitting slate tiles. No roof space is present, although the top floor (accessible via external walkways) is used as a plant room. The building is in good structural condition.

Images 7, 11 and 12 in Appendix B show both buildings.

3.2.2 External inspection

No evidence of bat presence (such as droppings or urine/fur staining) was observed during the external inspections.

Both buildings were found to be in good structural condition and neither supported extensive features that were considered suitable for roosting bats, such as weatherboarding, hanging tiles, or damaged and slipped roof tiles. Where potential roost features where observed, such as soffit boxes, barge boards, lead flashing and roof tiles, these were found to be tightly fitting and well sealed with limited access points that could be used by bats. However, gaps between the concrete facing of building Q1 could potentially be utilised by crevice dwelling bats if deep enough.

A series of louvre air vents above the fourth floor windows of building Q1 have the potential to be used by bats to access the roof space. Potential bat access points into the plant rooms of Building Q2 also exist via gaps between the external door ventilation grilles. Photographs of these features are shown in Images 13 and 14 of Appendix B.

Given the design and structural integrity of both buildings, the likelihood of bats roosting under/behind external features of either building is considered to be low.

3.2.3 Internal inspection

The roof space of building Q1 consists of a single large void with wooden sarking supported by timber beams, steel girders and concrete posts. The beams and sarking were generally tight fitting with few gaps and crevices, although some gaps between overlapping beams were observed. The roof space was well maintained and uncluttered and no evidence of bat presence (such as droppings, feeding remains, bats or staining) was observed in the areas surveyed.

The plant rooms of building Q2 consist of large rooms with concrete walls, aluminium panel ceilings with steel roof supports and beams. Each room houses machinery and pipework and is subject to moderate levels of noise disturbance. Potential roost spaces occur in gaps between steel girders and the ceiling, as well as between aluminium panelling and the walls. No evidence of bat presence (such

as droppings, feeding remains, bats or staining) was observed in the areas surveyed.

Images 15 and 16 show the internal features of both roof spaces.

3.3 Other species

No evidence of other protected species was observed during the survey, although all areas of scrub, hedgerows and trees have the potential for use by nesting birds.

Both ponds on the site are considered to be sub-optimal to support great crested newts *(Triturus cristatus)* due to the absence of macrophytes, the quality of terrestrial habitat and the apparent isolation of the site from other suitable waterbodies. However, the ponds could be utilised by breeding common frog (*Rana temporaria)* or common toad *(Bufo bufo)*.

The site is also considered to offer negligible potential to support other protected species such as dormice *(Muscardinus avellanarius)*, reptiles, water voles *(Arvicola terrestris)* and otters *(Lutra lutra)* due to sub-optimal on-site habitats. However, the site does support suitable foraging habitat for badgers *(Meles meles)*, especially given its proximity to a nearby railway line – a habitat feature often associated with this species. Anecdotal records from National Archives staff also suggest that badgers may be active within the vicinity.

The areas of ornamental planting and boundary scrub and hedgerows are likely to provide a feeding resource for invertebrates. The hedgerows and areas of grassland could also potentially be used by sheltering and foraging hedgehogs *(Erinaceus europaeus)*, a UK Biodiversity Action Plan species.

4 Discussion and recommendations

4.1 Habitats

The National Archives site is a small area of land located in a predominantly urban setting. Whilst the site is dominated by two buildings and areas of hardstanding, there are a variety of landscaped and ornamental habitats within the remaining available land, including grassland, trees, hedgerows, ponds and scrub. Additionally, although the site is located within an urban area, its proximity to the linear habitats of the River Thames and adjacent railway line, as well as open green space associated with the nearby Kew Gardens and residential properties, means that the site has the potential to contribute towards the biodiversity resource of the local area.

Of the habitats found on site, grassland areas are amongst the most abundant. At the time of survey, all areas of grassland were closely mown and supported a low diversity of herb and grass species. As such, the areas of grassland in their current condition are considered to be of low ecological value. However, the biodiversity value of these areas can easily be enhanced by sowing an appropriate wildflower seed mix and/or adopting a more sympathetic mowing regime that allows areas of grassland to grow 'wild' throughout much of the year.

Outline recommendation 1: Grassland enhancements

- Allocate areas of grassland that will be managed for biodiversity.
- Cut these areas of grassland twice a year, once before April and once after August. Light strimming can be used to control excess growth; in this instance try to create a variety of sward heights.
- Aim to leave some areas of grassland uncut throughout the entire year, especially in corners of the site or in close proximity to hedges and scrub.
- Consider sowing a native meadow grassland seed mixture (MG5 *Centaurea nigra-Cynosurus cristatus* grassland mixture would be suitable).

Target species: invertebrates (including butterflies, grasshoppers and crickets), small mammals, amphibians, ground foraging birds.

The two ponds recorded during the survey represent large areas of habitat within the site. However, whilst aquatic habitats have great potential to be of high biodiversity value, the on-site ponds provide limited opportunities for wildlife owing to the complete absence of vegetation and the 'hard' habitats immediately adjacent to them. Pond 1 also supported an algal bloom which indicates low levels of oxygenation, perhaps due to the absence of aquatic vegetation. As such, the ponds in their current condition are considered to be of low ecological value.

Outline recommendation 2: Pond enhancements

- Encourage or introduce native and non-aggressive aquatic plant growth. Aim to create a mosaic of vegetation and habitat types including submerged, emergent, floating and rooting plants.
- Remove the dense scrub on the island and replace with flowering tall ruderal species. Consider creating a log pile here.
- Create a shallow sloping area, to allow easy access and egress for waterfowl and amphibians.
- Create a 'wild' area alongside Pond 2 for the benefit of amphibians. Consider creating a log pile here.
- Maintain a clean water supply and avoid topping up with tapped water (due to presence of chlorine).
- Use bales of barley straw to control algae growth.

Target species: invertebrates (notably aquatic invertebrates, dragonflies and damselflies), amphibians, waterfowl.

Many of the habitats recorded during the survey are young or newly established (such as the many trees and areas of ornamental shrubbery) and so at present do not achieve their full biodiversity potential; however, this potential and their value to biodiversity will increase as these habitats mature and establish themselves; this is particularly applicable to the on-site trees. To compensate for the limited nesting features in the young trees (such as natural holes, woodpecker holes, splits and cracks etc), National Archives staff have erected a number of bird boxes. A log pile has also been created for the benefit of dead wood dependent invertebrates and sheltering small mammals. The continuation of these simple habitat enhancement measures should be encouraged.

Of the habitats recorded on site, it is the boundary hedgerows and areas of scrub that offer the most value for biodiversity in their current condition. The entire site boundary consists of a well established hedgerow or belts of scrub comprising a mixture of native woody species. This habitat is likely to be of value for nesting and foraging birds, small mammals and invertebrates. If the hedgerows are currently managed as part of a grounds maintenance regime, cutting should preferably take place every third year on a rotational cycle so that all hedgerows are not cut in the same year; this will ensure flowers and fruit will remain available to birds, small mammals and invertebrates. If cutting must be undertaken annually, consideration should be given to cutting the hedge at a higher level than the previous year so that the hedge can grow taller. Hedgerow maintenance should ideally be scheduled to take place during January and February after most of the berries have been eaten but before the bird nesting season.

Much of the site is dominated by two large buildings that offer limited potential for biodiversity due to their age, design and structural integrity. As the buildings occupy such a large footprint within the site, their potential for biodiversity should be maximised.

Outline recommendation 3: Building enhancements

- Erect bird boxes, swift bricks and bat boxes, bricks and tubes onto suitable external walls. Each box, brick or tube should be erected at the appropriate elevation and aspect for the target species.
- Grow native climbing plants, such as ivy (*Hedera helix)*, traveller's-joy *(Clematis vitalva)*, bittersweet *(Solanum dulcamara)* and white bryony *(Bryonia dioica)* up bare external walls.

Target species: nesting and foraging birds, invertebrates.

4.2 Legally protected and notable species

Bats

No evidence of bat presence was observed during the survey and given the design and structural integrity of both buildings, the potential for bats to roost under/behind external features of either structure is considered to be low.

However, the presence of bat roosts and bat activity has a strong correlation with the proximity to waterbodies and riparian habitat. As the National Archives site is located immediately adjacent to the River Thames, and as potential access points are present in each building that could allow bats access into the roof space and/or plant rooms, there is potential for bats to use internal parts of the buildings for roosting.

Although the site does not support any trees that are considered suitable for roosting bats, the boundary hedgerows have the potential to be used by commuting and/or foraging bats and National Archives staff have provided anecdotal records of pipistrelle bats foraging close to the building.

To enhance the site for bats, consideration should be given to erecting bat boxes onto buildings and mature trees. Additional measures that would enhance the value of the site for bats include the creation of areas of rough grassland and the improvement of the pond habitats; both of these enhancements would encourage invertebrates which are the prey items for bats. The dimming or removal of permanent bright external lighting, especially in close proximity to trees and boundary hedgerows, may also encourage bats onto the site.

Other protected and notable species

At the time of survey, the habitats recorded on site were considered to offer limited value for other legally protected species, although a single grey heron – a species listed on the London Borough of Richmond Biodiversity Action Plan (BAP) – was recorded on Pond 1.

The site does (or could easily) support suitable habitat for Biodiversity Action Plan Species[1] including common frog, common toad, hedgehog, song thrush *(Turdus philomelos)*, stag beetle *(Lucanus cervus)*, bumble bee *(Bombus spp)* and dragonflies *(Anispotera spp)*. The enhancement of the on-site habitats for these target species should be encouraged and should form a central part of a future National Archives Biodiversity Action Plan.

[1] Taken from species listed on the London BAP and LB Richmond upon Thames BAP.

However, in the interim, implementation of the outline recommendations described above, in combination with the current habitat enhancements (including creation of log piles, hedgehog houses, nest boxes etc) being initiated by National Archives staff, will help provide habitats suitable for a range of biodiversity and potentially those listed on the London BAP and London Borough of Richmond upon Thames BAP.

4.3 Biodiversity Action Plan

The results of this survey and site assessment will inform the production of a National Archives Biodiversity Action Plan for the site at Kew. The BAP will seek to enhance the biodiversity value of the site for target species and habitats, notably those listed on other local, regional and national BAPs. The proposed BAP will form the basis of any detailed biodiversity management recommendations for this site.

5 Conclusion

An Extended Phase 1 Habitat survey and internal and external bat inspection was undertaken by a suitably qualified and experienced ecologist on the 18th August 2010.

Eight habitat types were recorded during the survey, these comprised of parkland, species poor semi-improved grassland, amenity grassland, standing water, introduced shrubs, hedgerows, buildings and bare ground. The majority of the site is accessible to the public and is subject to regular maintenance.

No evidence of bat presence in buildings Q1 or Q2 was identified during the survey and the potential for bats to roost under/behind external features of either building is considered to be low. However, potential access points that would allow bats access into the roof space of building Q1 and the plant rooms of building Q2 were observed.

The site is considered to offer low potential to support other legally protected species and the majority of habitats found on site are of limited ecological value (in their current condition). Outline recommendations have been provided that will enhance the biodiversity value of the on-site habitats, notably for species listed on the London BAP and London Borough of Richmond upon Thames BAP.

The results of this survey will be used to inform the production of a National Archives BAP for this site. The proposed BAP will form the basis of any detailed biodiversity management recommendations for this site.

6 References

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- Farming and Wildlife Advisory Group [online]. *Technical Information: Hedgerow Management*. http://forum.fwag.org/data/document/3390.pdf. Accessed November 2010.

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- Mitchell-Jones, A.J. (2004). *Bat Mitigation Guidelines.* English Nature, Peterborough.

- Richmond Biodiversity Group [online]. *Biodiversity Action Plan Richmond upon Thames*. http://www.richmond.gov.uk/richmond_biodiversity_action_plan2-2.pdf. Accessed October 2010.

Appendix A Phase 1 Habitat Survey map and target notes

Target note	Description
1	Pond 1 with link via weir to Pond 2. Algal bloom throughout most of pond. No emergent or aquatic vegetation. Surrounded by hardstanding. Could be significantly improved with planting and control of algae. Grey heron.
2	Young whitebeam trees. Bare ground below trees – could be improved with grassland seeding. Nest box and insect box erected on nearby external wall.
3	Grassland and trees to north of Pond 2. Grass could be enhanced, especially given proximity to pond. Nest boxes on nearby trees. Alder, silver birch, goat willow along pond banks.
4	Pond 2. Concrete sides with some overhanging trees. Island densely planted with ornamental shrubs and weeping willow. No aquatic vegetation. Sweetener flow via weir connection with Pond 1. Could be greatly enhanced. Coot, moorhen, mallard. Chicks.
5	Amenity grassland picnic area. Newly planted trees.
6	Mature cedar tree *(Cedrus deodara)* in small area of amenity grassland. Low bat potential.
7	Mature cedar tree. Low bat potential.
8	Log pile.
9	Ventilation grilles. Potential access points into roof space for bats.

Legend

- Study area boundary
- Target notes
- Tree
- Species rich intact hedge
- Wall
- Broad-leaved plantation
- Dense/continuous scrub
- SI — Poor semi-improved grassland
- Standing water
- Hard standing
- A — Amenity grassland
- Introduced shrub
- Buildings

N

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Appendix B Site photographs

Image 1. Southern corner of building Q2 and ornamental planting.

Image 2. Short grassland and trees in north western car park.

Image 3. Typical area of short grassland and trees.

Image 4. Pond 1.

Image 5. Pond 2.

Image 6. Island on Pond 2.

Image 7. Building Q2 and amenity grassland viewed from the south west.

Image 8. Log pile in shrubbery along western boundary.

Image 9. Cedar tree in car park to east of site entrance.

Image 10. Cedar tree to north of site entrance.

Image 11. Building Q1.

Image 12. Building Q2.

Image 13. Louvre air vents around the top of building Q1.

Image 14. Louvre ventilation panels on plant room doors of building Q2.

Image 15. Internal view of plant rooms.

Image 16. Internal view of Q1 roof space.