

SILVERTOWN TUNNEL

**Environmental Statement
Appendix 9.A (6.3.9.1)**

**Extended Phase 1 Habitat
Survey (2015)**

April 2016

Silvertown Tunnel

Extended Phase 1 Habitat Survey (2015)

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List of Abbreviations

DCO	Development Consent Order
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESP	Ephemeral/short perennial vegetation
GiGL	Greenspace Information for Greater London
JNCC	Joint Nature Conservancy Committee
LNR	Local Nature Reserve
NSIP	Nationally Significant Infrastructure Project
SINCS	Sites of Importance for Nature Conservation
TfL	Transport for London
WCA	Wildlife Countryside Act

Glossary of Terms

Blackwall Tunnel	An existing road tunnel underneath the River Thames in east London, linking the London Borough of Tower Hamlets with the Royal Borough of Greenwich, comprising two bores each with two lanes of traffic.
Extended Phase 1 Habitat Survey	Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. Habitats are mapped based on the vegetation present. The technique is often extended to give further consideration to the potential of habitats to support protected species and species of conservation concern.
Silvertown Tunnel	Proposed new twin-bore road tunnels under the River Thames from the A1020 in Silvertown to the A102 on Greenwich Peninsula, East London.

1. INTRODUCTION

1.1 Context

- 1.1.1 This Appendix report details the methodology and results of an extended Phase 1 habitat survey of the Scheme carried out in October 2015, which updated surveys undertaken in November 2013 and March 2014. The report includes an assessment of potential ecological constraints and appropriate suggestions for mitigation and enhancement.

1.2 Ecology background

Desk study

- 1.2.1 As part of the original baseline assessment, information on statutory and non-statutory designated sites and records of protected species or species otherwise of conservation concern within 2km of the Order limits were purchased from Greenspace Information for Greater London (GiGL) in June 2014.
- 1.2.2 The GiGL search identified one statutory designated site, Mudchute Park Farm Local Nature Reserve (LNR), within 2km of the order limits (as shown on Drawing 9.1 – *Statutory Sites* (Document Reference: 6.2) of the ES). Sixteen non-statutory designated sites, all Sites of Importance for Nature Conservation (SINCs), were identified, as shown on Drawing 9.2 – *Non Statutory Site* (Document Reference: 6.2) of the ES. One of these sites, River Thames and Tidal Tributaries SINC, is partially located within the Order Limits. Potential impacts on this SINC are addressed in Chapter 10 – Marine Ecology (Document Reference: 6.1.10). Impacts on all other sites are addressed in Chapter 9- Terrestrial Ecology (Document Reference: 6.1.9).
- 1.2.3 Records of protected species or species of conservation concern received from GiGL included over 50 plant species and over 70 invertebrate species including stag beetle (*Lucanus cervus*). Two amphibian species, common frog (*Rana temporaria*) and common toad (*Bufo bufo*) and one reptile species, slow worm (*Anguis fragilis*) were also obtained. Records of over 90 bird species, which included 36 Wildlife and Countryside Act, 1981 (WCA) Schedule 1 species, including black redstart (*Phoenicurus ochruros*), were also provided. Records of mammals within 2km of the Order limits included six species of bat and hedgehog (*Erinaceus europaeus*).

Extended Phase 1 habitat survey

- 1.2.4 An extended Phase 1 habitat survey of the Site was undertaken in November 2013 and March 2014. This comprised a walkover to identify the main habitats on Site, and to evaluate their potential to support protected species or species otherwise of conservation concern.
- 1.2.5 The survey identified habitats typical of the built environment, with the majority of the Site being formed of hard standing. The site north of the River Thames (Silvertown site) was predominantly industrial-use formed of hard standing, but contained some habitats of ecological value including broadleaved plantation woodland, dense/continuous scrub, scattered scrub, scattered broadleaved trees, semi-improved grassland, tall ruderal vegetation, ephemeral/short perennial vegetation (ESP), amenity grassland and standing water.
- 1.2.6 South of the River (Greenwich site) was predominantly associated with busy roads and a large car park, but had a large area of dense/continuous scrub in the centre of the site. Other habitats included broadleaved plantation woodland, scattered scrub, scattered broadleaved trees, semi-improved grassland, tall ruderal vegetation, ephemeral/short perennial vegetation and amenity grassland. The WCA non-native invasive species Japanese knotweed (*Fallopia japonica*) and Virginia Creeper (*Parthenocissus quinquefolia*) were also recorded.
- 1.2.7 The habitats on Site were evaluated as having potential to support a number of protected species or species otherwise of conservation concern, which included invertebrates, reptiles, breeding birds including black redstart and bats.

Further surveys

- 1.2.8 Targeted surveys in line with best practice methods were undertaken for the species (groups) above, including black redstart. An arboricultural survey was also undertaken.
- 1.2.9 During the invertebrate survey 311 species were recorded across both sites, including two Red Data Book species and 17 Nationally Scarce species. No reptiles and no black redstarts were recorded during the dedicated surveys. Low levels of bat activity in relatively isolated areas were recorded during bat activity surveys. Further details of the methods and results of these further surveys can be found in Appendices 9.B-9.E (Document Reference: 6.3.9.2 – 6.3.9.5).

2. METHODOLOGY

2.1 Extended Phase 1 habitat survey

2.1.1 An extended Phase 1 habitat survey of the Site was undertaken by Demian Lyle BSc (Hons) MSc DipIC MCIEEM on the 15th (Silvertown) and 16th (Greenwich) October 2015. The survey involved identifying and mapping the main habitat types, following the Joint Nature Conservancy Committee (JNCC) Phase 1 habitat survey methodology (JNCC, 2010). Dominant plant species were noted, as were any protected or uncommon species or species indicative of particular habitat types. Botanical names follow Stace (2010). The JNCC methodology was 'extended' to include the identification of any signs of protected species or species otherwise of conservation concern and the potential for the habitats to support such species.

2.1.2 Areas of Japanese Knotweed have been mapped independently of the Phase 1 habitat classifications as this is an invasive species and therefore it is important to clearly show the area it occupies within a site.

2.2 Limitations

2.2.1 For the 2015 update surveys, access was not available for the highway maintenance compound in the centre of the Greenwich site. However, during the original surveys (undertaken in 2013/14) access was available into the compound, apart from an area of impenetrable dense scrub within it. Therefore the previous survey information has been used in this area, cross-referenced against aerial photography from Google Earth and Bing Maps. It was not considered to be a limitation to the assessment.

2.2.2 There are no other known limitations to the extended Phase 1 habitat survey, which was undertaken at a suitable time of year (JNCC, 2010) when most plant species present on site should be visible above ground and identifiable.

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3. RESULTS

3.1 Phase 1 habitat survey

- 3.1.1 The general distribution of the habitats was broadly congruous with those of the original survey, congruous with open mosaic habitat on previously disturbed land. Some habitats had changed due to natural changes or altered management, for example one area originally recorded as poor semi-improved grassland had been subject to a regular mowing regime, causing it to return to amenity grassland. The distribution of the habitats recorded on Site during the 2015 survey are shown on Drawing 9.3 – *Phase 1 Habitat Survey (Greenwich and Silvertown)* (Document Reference: 6.2) of the ES.
- 3.1.2 Table 3-1 and Table 3-2 below provide summary descriptions of each of the habitats recorded on the Silvertown and Greenwich sites respectively in 2015. There is a total of approximately 58,169m² of semi-natural habitat on site, with dense/continuous scrub (12,261m²) and amenity grassland (15,575m²) being the most extensive of these.

Table 3-1: Description of habitats recorded on the Silvertown site

Habitat type	Description	Key species	Total area (m ²)
Broadleaved plantation woodland	Five parcels in the north of the Silvertown site, associated with the Tidal Basin Road Roundabout and Lower Lea Crossing road. The trees were approximately 20 years old.	False acacia (<i>Robinia pseudoacacia</i>), London Plane (<i>Platanus x hispanica</i>), Ash (<i>Fraxinus excelsior</i>), White Poplar (<i>Populus alba</i>)	3,427
Dense/continuous scrub	Generally low quality scrub in areas of unused and unmanaged land, often associated with boundary features.	Bramble (<i>Rubus fruticosus</i> agg.), Elder (<i>Sambucus nigra</i>) Dogwood (<i>Cornus sanguinea</i>)	3,284
Scattered scrub	Occurred across the site, usually growing from small patches of bare ground or gaps in concrete.	Bramble, Elder, Dogwood	Approximately 28 point locations
Scattered broadleaved woodland	Predominantly lines of trees associated with strips of amenity grassland.	Pear (<i>Pyrus communis</i>), London plane, Sycamore (<i>Acer pseudoplatanus</i>)	Approximately 31 point locations
Species-poor semi-improved grassland	Relatively small patches of unmanaged grassland occurred across the Silvertown site.	Yarrow (<i>Achillea millefolium</i>), Broad-leaved Dock (<i>Rumex obtusifolius</i>), Annual Meadow-grass (<i>Poa annua</i>), Common Ragwort (<i>Senecio jacobaea</i>), False Oat-grass (<i>Arrhenatherum elatius</i>), Canadian Fleabane (<i>Conyza Canadensis</i>), Scentless Mayweed	3,856

Habitat type	Description	Key species	Total area (m ²)
		<i>(Tripleurospermum inodorum)</i>	
Tall ruderal vegetation	More than ten parcels scattered around the north of the Silvertown site, often in proximity to waterbodies.	Hedge Bindweed (<i>Calystegia sepium</i>), Annual Mercury (<i>Mercurialis annua</i>), Common Ragwort, Common Nettle (<i>Urtica dioica</i>), Cow Parsley (<i>Anthriscus sylvestris</i>), Scentless Mayweed, Dove's-foot Crane's-bill (<i>Geranium molle</i>)	2,466
Standing water	<p>Four waterbodies were located in the north, centre (2) and towards the south of the Silvertown site.</p> <p>The northernmost waterbody was the smallest, was ephemeral, and was surrounded by hard standing and mounds colonised by tall ruderal vegetation.</p> <p>The centrally located standing water parcel was a settling pond for silt; it had steep banks and a fluctuating water level. It was surrounded by tall ruderal, scattered scrub and ESP. An outlet channel connects the pond to the River Thames.</p> <p>The southern waterbody was situated in a disused area of hard standing and</p>	<p><u>Northern waterbody</u></p> <p>Celery-leaved buttercup (<i>Ranunculus sceleratus</i>), Greater Bulrush (<i>Typha latifolia</i>)</p> <p><u>Central waterbodies</u></p> <p>Common Reed (<i>Phragmites australis</i>)</p> <p><u>Southern waterbody</u></p> <p>Common Reed, Greater Bulrush</p>	1,268

Habitat type	Description	Key species	Total area (m ²)
	appeared to be a shallow waterbody within a rectangular depression with no drainage. It had limited in water vegetation but had an area of emergent vegetation at its southern end.		
Species-poor intact hedge with trees	A linear strip of broadleaved trees parallel to fence line	Blackthorn (<i>Prunus spinosa</i>), Pear, Cherry laurel (<i>Prunus laurocerasus</i>)	120m
Amenity grassland	Three parcels of amenity grassland occurred on the Silvertown site; the most significant was a strip in the centre of the site between Dock Road and a fence-line.	Dandelion (<i>Taraxacum officinale</i> agg.), Creeping Buttercup (<i>Ranunculus repens</i>), Red Dead-nettle (<i>Lamium purpureum</i>), Common Chickweed (<i>Stellaria media</i>), Dove's-foot Crane's-bill	795
Introduced shrub	Varying sized parcels and scattered individual bushes recorded across the site, most significantly in the north.	Butterfly-bush (<i>Buddleja davidii</i>)	2,536
Japanese Knotweed (<i>Fallopia japonica</i>) (tall ruderal)	A large stand was located in the north of the Silvertown site in a raised, apparently little-used location.	Japanese Knotweed	157 (1 stand)
Ephemeral/Short Perennial herbs	Patches of ESP the across the site in areas of wasteland.	Common Ragwort, Canadian Fleabane, Hawksbeard (<i>Crepis</i> sp.),	2,116

Habitat type	Description	Key species	Total area (m²)
(ESP)		Bramble	
Bare ground	Areas of bare ground throughout the the site, often associated with early-successional communities and therefore forming part of open mosaic habitat	N/A	3,978

Table 3-2: Description of habitats recorded on the Greenwich site

Habitat type	Description	Key Species Recorded	Area (m ²)
Broadleaved plantation woodland	There was a parcel of plantation broadleaved woodland in the centre of the Greenwich site, adjacent to amenity grassland and an industrial site. , and also had a small stand of Japanese knotweed in its south-west corner (TN4a).	Sycamore, Silver Birch (<i>Betula pendula</i>), London Plane, Japanese Knotweed	1,485
Dense/continuous scrub	A large patch of dense/continuous scrub was located in the centre of the Greenwich site, it contained a line of London Plane trees along its northern border. It had a parcel of semi-improved grassland at its centre.	Bramble, Grey Willow (<i>Salix cinerea</i>), Elder, Butterfly-bush	8,978
Scattered scrub	Occurred mostly in the south of the Greenwich site, usually associated with small	Bramble, Elder	40 point locations

Habitat type	Description	Key Species Recorded	Area (m ²)
	patches of wasteland.		
Scattered broadleaved trees	Scattered throughout the site, predominantly in small strips of amenity grassland but also within semi-improved grassland and ephemeral/short perennial vegetation.	Silver Birch, Crack-willow (<i>Salix fragilis</i>), Pedunculate Oak (<i>Quercus robur</i>), Sycamore, London Plane, False-acacia	114 point locations
Species-poor semi-improved grassland	Four relatively small parcels of semi-improved grassland occurred within the Greenwich site. The parcels contained common and widespread species.	Broadleaved Dock, Common Vetch (<i>Vicia sativa</i>), Creeping Cinquefoil (<i>Potentilla reptans</i>), Cock's-foot (<i>Dactylis glomerata</i>), Yarrow, Dandelion, Common Mallow (<i>Malva sylvestris</i>), Perennial rye-grass, False Oat-grass, Spotted Medicago (<i>arabica</i>)	2,692
Tall ruderal vegetation	A small parcel of tall ruderal vegetation was located in the	Ragwort, False Oat-grass, Mugwort (<i>Artemisia vulgaris</i>),	496

Habitat type	Description	Key Species Recorded	Area (m ²)
	north of the Greenwich site behind a chain-link fence adjacent to a large area of amenity grassland.	Broad-leaved Dock, Red Dead-nettle	
Amenity grassland	<p>Small strips and larger parcels of amenity grassland occurred throughout the Greenwich site, some associated with scattered broadleaved trees.</p> <p>One particularly large area of mown, short-sward grassland in the north-west of the Greenwich site was previously recorded as unmanaged semi-improved grassland and still retains species diversity more typical of this habitat type, though it was dominated by species associated with amenity grassland.</p>	Perennial Rye-grass, Ribwort Plantain (<i>Plantago lanceolata</i>), Dandelion, Creeping Thistle (<i>Cirsium arvense</i>), Yarrow, Creeping Cinquefoil, Daisy (<i>Bellis Perennis</i>), Cock's-foot, Red Fescue (<i>Festuca rubra</i>), Creeping Buttercup (<i>Ranunculus repens</i>), Annual Meadow-grass, False Oat-grass, Spear Thistle	10,800

Habitat type	Description	Key Species Recorded	Area (m ²)
ESP	Patches of ESP were recorded across the Greenwich site. The parcels surrounding the large car park in the north-east of the site were formed exclusively of ivy (<i>Hedera helix</i>). The largest area of ESP was located in the centre of the Greenwich site, had greater species-diversity, contained individual occurrences of tall ruderal vegetation and had potential to support black redstart.	Hedge Bindweed (<i>Calystegia sepium</i>), Canadian Fleabane, Ragwort, Mugwort, Spear Thistle (<i>Cirsium vulgare</i>), Annual Meadow-grass, Annual Mercury	4,597
Scattered introduced shrub	A scattered line of Butterfly-bush occurred alongside the fence to the north-east of the large dense/continuous scrub parcel. There were also occurrences of scattered introduced shrub in the south of the site.	Butterfly-bush	15 point locations

Habitat type	Description	Key Species Recorded	Area (m²)
<p>Scattered Japanese knotweed (Tall ruderal)</p>	<p>Two small stands of Japanese knotweed occur in close proximity to each other in the centre of the site (TN4a and TN4b). The larger of the two was located in the south-west corner of the plantation broadleaved woodland parcel in the central part of the site. The smaller was approximately 20m to the south-west on the edge of an industrial yard.</p>	<p>Japanese knotweed</p>	<p>2 point locations</p>

3.2 Target notes

3.2.1 Target notes of significant ecological features are described in Table 3-3 below and their locations shown on Drawing 9.3 – *Phase 1 Habitat Survey (Greenwich and Silvertown)* (Document Reference: 6.2) of the ES.

Table 3-3 Target notes from extended Phase 1 habitat survey

Target note number	Description
Silvertown	
1	A pile of brash within a small parcel of plantation woodland forming a suitable refuge for hedgehog and other small mammals.
2	Mounds of rubble in a wasteland setting forming suitable habitat for foraging black redstart and invertebrates.
3	A large stand of Japanese Knotweed in the north of the Silvertown site.
Greenwich	
4	Log/brash piles within plantation woodland forming a suitable refuge for hedgehog and other small mammals and notable invertebrates including stag beetle.
5a and 5b	Two small stands of Japanese knotweed in close proximity to each other, located on the south-west border of plantation woodland (4a) and on the edge of an industrial site (4b).

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4. POTENTIAL ECOLOGICAL CONSTRAINTS

4.1 Habitats

4.1.1 Due to the heavily urbanised nature of the local area, the semi-natural habitats recorded on Site have all been evaluated as having ecological value in the context of the wider environment.

4.1.2 National and local planning policy requires developments to provide no net loss in the ecological value of a site. Therefore recommendations are made in Section 5 in order for the Scheme to comply with this policy.

4.2 Protected species and species otherwise of conservation concern

Plants

4.2.1 No protected species of plant were recorded during the extended Phase 1 habitat survey.

Invertebrates

4.2.2 As with the original extended Phase 1 habitat survey, habitats with the potential to support notable invertebrates (including stag beetle, protected under the WCA), most significantly semi-improved grassland, standing water and wasteland (e.g. ESP and scrub), were recorded during the 2015 update. This was corroborated by the results of the 2014 invertebrate survey which recorded 311 species including two Red Data Book species and 17 Nationally Scarce species. Recommendations to mitigate likely impacts on invertebrates, in line with the WCA and national and local planning policy, are made in Section 5.

Amphibians

4.2.3 In the context of the wider environment and the large areas of hard standing within the order limits, the habitats on Site are evaluated as having negligible potential to support amphibians.

Reptiles

4.2.4 Certain areas of the Site with semi-improved grassland and scrub have low potential to support reptiles. Reptile surveys in line with best practice guidance were undertaken on both the Silvertown and Greenwich sites in 2014 with no reptiles recorded. Based on these results, reptiles are likely to be absent from the Site.

Breeding birds

- 4.2.5 Habitats with the potential to support breeding birds, most significantly broadleaved plantation woodland, dense/continuous scrub, scattered scrub and scattered trees, were recorded on Site. Wild birds, including their eggs and active nests, are protected from killing and injury (damage and destruction in the case of eggs and nests) under the WCA.

Black redstart

- 4.2.6 As in the previous survey, the Site was found to contain habitats, notably the brownfield areas, and features, including piles of rubble (TN2), which have the potential to support black redstart.
- 4.2.7 Black redstart is listed under Schedule 1 of the WCA, which, in addition to the protection afforded to all wild birds, makes it an offence to disturb this species while it is at, on or near an active nest.
- 4.2.8 Targeted black redstart surveys were undertaken in 2014 with no black redstarts recorded. However, black redstart is not easily detectable and in addition is highly mobile and not limited by ecological barriers; therefore, due to the high suitability of parts the Site and its position in key black redstart territory, black redstart is included in the assessment. Recommendations for the mitigation of potential impacts to black redstart are made in Section 5.

Hedgehog

- 4.2.9 There is potential for hedgehog (*Erinaceus europaeus*) to be present on site, especially in areas of brash (e.g. TN1 and TN3). Hedgehog is a species of principle importance listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Recommendations to mitigate potential impacts on hedgehog are proposed in Section 5.

4.3 Non-native invasive species

- 4.3.1 Three occurrences of Japanese knotweed occur across the Site; one large stand on the Silvertown side and two small stands on the Greenwich side.
- 4.3.2 Japanese knotweed is listed under Schedule 9 of the WCA, making it illegal to plant or otherwise cause the plant to grow in the wild. It is also classified as controlled waste, regulated under the Environmental Protection Act, 1990.
- 4.3.3 Virginia Creeper was recorded close to TN3 during the original extended Phase 1 habitat survey but not during the 2015 survey. Virginia Creeper is also listed under Schedule 9 of the WCA.

- 4.3.4 Butterfly-bush was recorded throughout the Site. Butterfly-bush is listed as a Category 3 species of concern by the London Invasive Species Initiative (LISI). Category 3 species are *“species of high impact or concern which are widespread in London and require concerted, coordinated and extensive action to control/eradicate”*.
- 4.3.5 Recommendations with regard to non-native invasive species are made in Section 5.

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5. RECOMMENDATIONS

5.1 Mitigation

5.1.1 The mitigation required will ultimately be decided by the outcome of the EIA; however, the mitigation should be based on the following principles:

- all habitats of ecological value that are to be lost as part of the Scheme should be replaced at least like for like to ensure no net loss;
- replacement planting schemes should use native species, ideally of local provenance;
- the Scheme should include tree and scrub planting on at least the same scale as that which is to be lost to provide nesting habitat for breeding birds;
- habitat suitable for invertebrates should be provided. This could be in the form of species-rich grasslands and brownfield habitat, which could in part be built as living roofs on new buildings. Partially buried log piles, essential habitat for the larval stage of stag beetle, should be included into the design;
- any features suitable for hedgehog, such as brash piles (TN1 and TN3), should be destructively searched by hand to prevent the likelihood of killing or injuring hedgehogs which may be within. Where possible, any hedgehogs found should be moved to a safe area outside of the working zone; and
- the Japanese Knotweed should be removed from the Site in accordance with the Knotweed Code of Practice (Environment Agency, 2006). Any other WCA Schedule 9 invasive species, such as Virginia Creeper, encountered during the life of the works should be removed from the Site in accordance with Environment Agency guidelines.

5.2 Enhancement

5.2.1 Some measures that would enhance the ecological value of the Site are as follows:

- while the site is currently suitable for black redstart, the opportunities provided are predominantly for foraging, whereas limited opportunities for nesting of this species have been recorded on site. The ecological

value of the Site could be enhanced post-development by providing sheltered ledges suitable for black redstart nesting and/or open-fronted nest boxes, as well as singing perches in selected locations around the site, facing the river where possible;

- similarly, there is currently suitable foraging habitat for bats on site but limited opportunities for roosting. Bat tiles and bat bricks built into the construction of new buildings or bat boxes on suitable trees would enhance the Site for bats post-development; and
- the Scheme design could include piles of brash and/or hedgehog houses placed in suitable locations near woodland, scrub or rough grassland.

6. REFERENCES

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