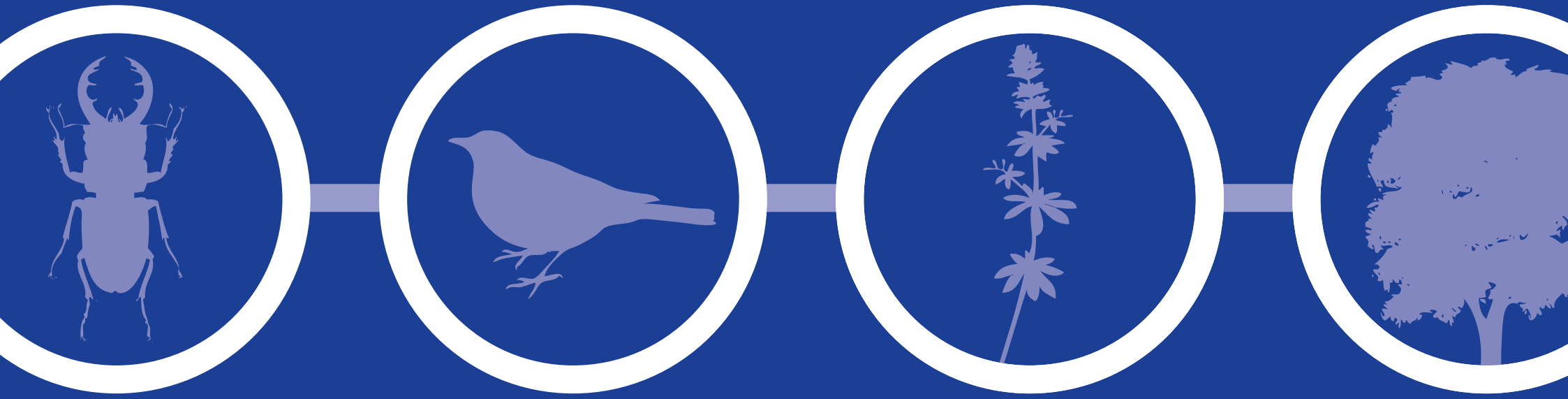
LU Biodiversity Action Plan 2010

Connecting Nature



MAYOR OF LONDON

Transport for London

Contents

1. Executive Summary

With around 3.5 million journeys made each weekday, and more than one billion journeys every year, London Underground (LU), part of Transport for London, is an essential part of any visit to London, and the daily lives of those who live and work in and around the capital.

Not only is the majority of the Underground above ground, it also makes up around 10% of wildlife habitat in the capital, making LU land holdings essential habitats for the wide range of plants and animals in London, many of which are legally protected. Because of this, the railway lineside environment is increasingly recognised for its contribution to London's green space and as a biodiversity asset for London.

As a responsible company, biodiversity protection is an integral part of LU's infrastructure management responsibilities, which includes upgrading, replacing and maintaining stations, signals, tracks, embankments, tunnels and bridges to name but a few.

In its first Biodiversity Action Plan (BAP) published in 2007, LU set out its initial commitments to meet the challenge of retaining a healthy wildlife-rich network whilst running a safe and efficient railway.

To coincide with the United Nations Internation Year of Biodiversity in 2010, the LU BAP is being updated to reflect the current shift in ecology and habitat management methods. It is hoped that LU's work will contribute to local and national efforts to halt and reverse the continuing decline of biodiversity.

The shift, led by organisations such as Natural England and its partners, looks to move conservation practices in the UK from protecting small-scattered pockets, to managing much larger swathes of land. This way of land management naturally supports national and regional targets for protection of endangered species and habitats, as well as helping to ensure that services provided by the natural environment, such as flood protection, water conservation, carbon dioxide storage, recreation facilities, and quality of life, are also preserved for us and generations to come.

LU's BAP, combined with a variety of other tools, will continue to ensure compliance with legislation, the objectives of *'Connecting London with Nature'* (the Mayor's Biodiversity Strategy), the aims of the Mayor of London's Urban Greening programme, and our biodiversity objectives to:

- conserve, and where reasonably practical to enhance, the biodiversity value of LU property
- increase awareness amongst staff and the travelling public of biodiversity in London

In meeting these objectives, LU ultimately contributes to the conservation of locally, regionally and nationally important species and habitats along its network, as well as making the natural environment accessible for Londoners.

2. Introduction

2.1 What is biodiversity?

Biological diversity, or biodiversity, is a term used to describe the variety of living things on the earth, from mammals to insects, trees to wildflowers and the habitats in which they live. It includes the diversity of species, genetic variability within a species, and their interactions with the environment.

The Earth's biodiversity is important to humans because it helps regulate and stabilise ecosystem processes that provide us with a wide range of benefits, or services, such as food, materials for construction, medicines, improving quality of life and wellbeing, as well as protection against adverse weather.

Our activities can significantly affect local and global biodiversity. Changes in land use and development can affect habitats and the species that depend on that habitat. Conserving biodiversity means protecting species and the habitats in which they exist as well as recovering degraded habitat that we, and future generations, depend on.

2.2 Summary of policy drivers and legislation

In 1992, the UK signed the 'Rio Convention' at the United Nations Earth Summit, and committed to halting biodiversity decline through the UK Biodiversity Action Plan (UK BAP). Local government authorities and many public and private organisations have since produced their own BAPs to identify local priorities and determine the contribution they can make to the delivery of the UK BAP. A London Biodiversity Action Plan has been produced by the London Biodiversity Partnership.

At a regional level, the Mayor of London's Statutory Biodiversity Strategy aims to enhance habitats in Greater London, implement policies for protecting and enhancing biodiversity and increasing Londoners' understanding and appreciation of the city's natural environment. The Mayor's Statutory Transport Strategy also seeks to conserve biodiversity through relevant programmes. Additionally, the Mayor's *'Draft Replacement London Plan',* which sets out an integrated economic, environmental, transport and social framework for the development of the capital over the next 20–25 years, includes Policy 7.19: Biodiversity and access to nature, which adopts the London BAP targets for habitat restoration and creation.

The Mayor published *'Leading to a Greener London'* in July 2009. His vision for the environment includes a 'Making London Greener' programme which, amongst other things, commits to implementing an All London Green Grid and promoting green roofs and walls. These are supported by Draft Replacement London Plan Policy: 2.18 green Infrastructure, and Policy 5.10: Urban Greening respectively.

Transport for London has its own Environment Strategy with an objective to maintain and where possible enhance the quality of London's natural

environment. This naturally reflects all the Mayor's strategic aims.

Supporting the aims of the Mayor's strategies, the London BAP and TfL's environment strategy naturally assists LU to meet its legal duty under the Natural Environment and Rural Communities Act 2006 "to have regard to conserving biodiversity in exercising their functions".

2.3 Biodiversity in 2010 and Landscape scale conservation

The United Nations declared 2010 as the International Year of Biodiversity. The aim of the dedicated year was to return biodiversity and its continuing decline back in the global spotlight since its profile was first raised at the Rio de Janeiro Earth Summit in 1992. The new Nagoya Summit held in late 2010 agreed goals and targets that look to "at least halve and where feasible" bring close to zero the rate of loss of natural habitats; as well as to increase the area of terrestrial and marine wildlife reserves globally.

In the UK, the first UK Biodiversity Action Plan was published in 1994. The most recent UK BAP report was released in 2008 and work continues to establish the success of national efforts. The Department for Environment, Fisheries, and Rural Affairs (Defra) recently launched two ecology reviews. *'Natural Environment – Adapting to Climate Change'*, published in March 2010, aims to establish if the UK's wildlife sites are capable of responding to the challenges of climate change and other pressures. In September 2010 the Lawton review *'Making Space for Nature'* was published. The review, comprised of a national ecosystem assessment examining the services our habitats and species provide to society and the economy, called for integrated biodiversity delivery at a landscape-scale and the establishment of Ecological Restoration Zones (ERZ). The current Government has promised to "introduce measures to protect wildlife and promote green spaces and wildlife corridors in order to halt the loss of habitats". Defra is set to incorporate the recommendations of these reviews into the forthcoming Natural Environment White Paper which is due in Spring 2011.

However, despite the implementation of BAPs and other conservation measures, and although the overall rate of loss has slowed, biodiversity is still in decline in the UK and globally due to such pressures as intensive farming, water and air pollution, water abstraction, and humanity's ever growing need for more space. Future climate change is likely to accelerate these losses too.

A change to the approach taken to manage nature conservation is needed so that the UK can halt the decline in biodiversity on its land and surrounding sea, and then work towards recovery. Legal protection of scattered areas of land, such as nature reserves with Sites of Special Scientific Interest (SSSI) status, and BAPs are currently used in the UK to protect endangered species and habitats.

To rebuild biodiversity on a landscape scale, areas with greatest potential must first be identified. In December 2009, Natural England published a document (*'Securing Biodiversity: the delivery framework for habitats and species in England'*) that presented the concept of Integrated Biodiversity Delivery Areas (IBDA), similar to the ERZs recommended in *'Making Space for Nature'*.

These large areas of land have been identified as a priority for biodiversity enhancement due to their existing biodiversity interest and where significant BAP delivery occurs. In London, Natural England has identified the Thames and Tributary area as suitable for landscape-scale conservation. The UK's Wildlife Trusts are also seeking to deliver large scale schemes called 'Living Landscapes', whilst the RSPB call their priority biodiversity conservation areas 'Futurescapes'. An important national RSPB Futurescape is the Thames Estuary, starting at Tower Bridge and extending out to sea. LU's land holdings and involvement with the Thames and Tributary areas have the potential to play an important role in supporting the delivery of projects like the Thames Futurescape; by providing corridors for wildlife, and links for Londoners to access the wider Thames Futurescape.

Landscape-scale restoration for biodiversity may not be feasible in the urbanised environment of central London, but the principles outlined above have been incorporated into the concept of green infrastructure, which seeks to promote, design

and manage a multifunctional network of green and natural spaces which can deliver, amongst other things, benefits for biodiversity. In London the concept of green infrastructure is being implemented through the All London Green Grid. LU can act as an important local partner by adapting where appropriate its current land management practices to align with the objectives of All London Green Grid.

Greenspace Information for Greater London (GiGL) has produced Habitat Suitability Maps for the London Biodiversity Partnership (LBP) that includes the IBDA Thames and Tributary area. GiGL is London's environmental records centre hosted by London Wildlife Trust. It collates, manages and makes available detailed information on London's wildlife, parks, nature reserves, gardens and other open spaces. TfL is a member of GiGL and LU contributes our wildlife and habitat data to this environmental records centre.

The Habitat Suitability Maps identify areas where priority London BAP habitats, such as acid grassland and heath, may be restored or increased in size because the ecological conditions are suitable. As part of its BAP, LU will establish where its land intersects areas identified on these maps and then seek to manage its land to increase priority habitats where practicable to do so to support the move to landscape-scale conservation of biodiversity, championed by Natural England, LBP and RSPB described above.

Benefits delivered by biodiversity

In the UK, our ecosystems conserve water supplies, protect against flooding and erosion, store millions of tonnes of CO_2 and provide the pollinating insects that our food crops depend on. On top of this they also provide a range of amenity facilities for us to picnic on, sail on and ramble through, benefiting the health and wellbeing of millions. In other words, our ecosystems provide services critical to our survival.

Economic studies such as The Ecology and Economics of Biodiversity (TEEB), the UN-backed investment bank led report, have tried to estimate the value of our ecosystems; with figures reaching in the billions. Yet the species and habitats providing these services are still in decline. Landscape scale conservation will halt the decline and help to restore biodiversity. We must also educate and sell the ecosystem services that our natural environment provides, so that people understand the economic, environmental and social benefits of biodiversity.

Climate change modelling indicates there will be a trend towards hotter, drier summers (interspersed with more intensive periods of rainfall) and warmer, wetter winters. This means the UK's countryside and urban areas need to be managed in ways that "climate change proof" our landscapes and sustain the ecosystem services they provide. Here are some examples of where conserving biodiversity will also help conserve our day-to-day lives.

Flood protection

In the UK, half our ancient woodland has been lost since the 1940s and 98% of lowland grassland since the 1950s, due to intensive agricultural practices and sprawling urban development. Green spaces and vegetation can help regulate water flow. Trees, plants and grass absorb water during periods of heavy rainfall and can reduce the impact of rainfall – particularly in the urban environment e.g. flash flooding. For LU, habitat management that contributes to water regulation can reduce the impact of heavy rainfall on our drainage systems and potential flooding of our assets.

Reducing urban "heat Islands"

In urban areas, summer temperatures can be up to 5°C higher than the countryside; conversely, in the winter months, the effects of driving wind and rain are exacerbated by being channelled between buildings. Increasing greenery, e.g. green roofs and living walls, will provide natural air conditioning that reduces temperatures, shade and act as natural wind suppressants. The contribution of our habitats and green spaces in contributing to reducing the urban heat island effect is important for our customers, staff and assets.

Pollution control

The air and water in urban environments is more polluted because of contaminants from transport and fuel combustion. Wetland vegetation, especially reedbeds, can be effective in filtering run-off from hard surfaces such as roads and car parks and in lessening the nutrient load in urban lakes that result in harmful algae growth. Trees and hedgerows can have a positive, if small, impact in filtering air and noise pollution too.

3. LU and Biodiversity

3.1 Wildlife and habitat overview of LU property

Although over half of the London Underground network is above ground, only eight of the eleven lines have any significant over-ground sections. The Metropolitan, Central and Piccadilly line make up almost 70% of the total trackside vegetation and wildlife area. The Circle line and Waterloo & City line do not have any above ground elements. The only above ground section of track on the Victoria line is a short section leading into the Northumberland Park depot.

Much of the network is on raised embankments and the natural soils and underlying geology have little impact on the vegetation. Most of LU's line-side habitats are 'semi-natural' or Brownfield, although other habitats include ancient woodlands, acid grassland and wetlands. The most mature woodlands with the highest diversity of species are present at the ends of the lines. Younger and less diverse woodlands (dominated by sycamore and ash) tend to occur closer to London, while much of the habitat in central London is wasteland habitat of variable quality. There are extensive areas of grassland and tall herb dominated vegetation in certain areas. There are few areas of wetlands or ponds on LU property.

While most of the habitats are not of national or regional importance for nature conservation, the semi natural rail-side habitats are considered as important for their local value. These habitats are particularly important when they are found close to central London.

Surveys carried out on the property have identified hundreds of plants and animal species on the LU network. Information on the habitats and species on LU's network came from a range of sources including:

- Biodiversity survey report (London Underground, 2000)
- Ecology Survey: Phase One SSL and BCV (2005)
- Ecology Survey: Phase Two SSL and BCV (2006)
- Phase One (plus) Survey of Tube Lines Jubilee, Northern and Piccadilly, depots and sidings (Tube Lines, 2006)
- Information from Greenspace Information for Greater London (GiGL)
- Other voluntary groups, e.g. the London Bat Group

The ecological surveys show that a number of locally and nationally rare species use LU property. Nationally rare or protected species have been found on a number of lines, including three species of bats, song thrush, wryneck and Great Crested Newts. Table 1 below lists the UK and London Biodiversity Action Plan (BAP) species recorded on London Underground property.

A number of 'notable for London' plant species, such as longheaded poppy, pale toadflax and greater celandine, have been recorded on London Underground property. A number of endangered and nationally scarce invertebrate species have also been recorded including UK BAP, Red Data Books endangered and Red Data Book unknown species.

Table 1 – Mammals recorded on LU property since 1999

		Bakerloo	Central	District	H&C	Jubilee	Metropolitan	Northern	Piccadilly	Victoria
Badger	*Meles meles*						■			
Common rat	*Rattus norvegicus*		■	■		■	■	■		■
Daubenton's bat	*Myotis daubentoni*						■	■		
Fox	*Vulpes vulpes*		■	■	■	■	■	■	■	
Field vole	*Microtus agrestris*					■			■	■
Grey squirrel	*Sciurus carolinensis*	■	■				■		■	
Hedgehog	*Erinaceus europaeus*								■	
Mole	*Talpa europaea*					■	■			
Muntjac deer	*Muntiacus reevesi*								■	
Pipistrelle bat	*Pipistrellus pipistrellus*		■				■	■		
Natterer's bat	*Myotis nattereri*							■		
Rabbit	*Oryctolagus cuniculus*		■	■		■	■		■	
Shrew	*Sorex araneus*		■							
Stoat	*Mustela erminea*						■		■	
Water vole	*Arvicola terrestris*		■	■						
Wood mouse	*Apodemus sylvaticus*		■	■	■	■	■		■	■

Table 2 – Reptiles and amphibians recorded on LU property since 1999

		Bakerloo	Central	District	H&C	Jubilee	Metropolitan	Northern	Piccadilly	Victoria
Reptiles										
Common lizard	*Lacerta vivipara*	■	■	■			■			
Grass snake	*Natrix natrix*		■	■			■		■	
Slow worm	*Anguis fragilis*	■	■	■			■	■		
Amphibians										
Common frog	*Rana temporaria*		■						■	
Common toad	*Bufo bufo*		■							
Great crested newt	*Triturus cristatus*		■	■			■			
Smooth newt	*Triturus vulgaris*		■	■			■		■	

Table 3 – Birds recorded on LU property since 1999

		Bakerloo	Central	District	H&C	Jubilee	Metropolitan	Northern	Piccadilly	Victoria
Blackbird	*Turdus merula*		■	■			■	■	■	
Black cap	*Sylvia atricapilla*			■			■			
Black headed gull	*Larus ridibundus*					■				
Blue tit	*Parus caeruleus*			■			■	■	■	

Table 3 – Birds recorded on LU property since 1999 – continued

		Bakerloo	Central	District	H&C	Jubilee	Met	Northern	Piccadilly	Victoria
Bullfinch	*Pyrrhula pyrrhula*						■	■		
Carrion crow	*Corvus corone*		■	■	■	■	■	■	■	
Chaffinch	*Fringilla coelebs*						■	■	■	
Chiff Chaff	*Phylloscopus collybita*						■			
Collared dove	*Streptopelia decaocto*		■	■			■	■	■	
Dunnock	*Prunella modularis*								■	
Feral pigeon	*Columba livia*				■	■	■	■	■	
Garden warbler	*Sylvia borin*								■	
Goldfinch	*Carduelis carduelis*		■				■		■	
Great tit	*Parus major*		■	■		■	■	■	■	
Greater spotted woodpecker	*Dendrocopos major*		■						■	
Greenfinch	*Carduelis chloris*		■				■			
Green woodpecker	*Picus viridis*		■	■		■		■	■	
Grey heron	*Ardea cinerea*							■		
Grey wagtail	*Motacilla cinerea*					■	■	■		
Herring gull	*Larus argentatus*					■				
House martin	*Delichon urbica*						■			
House sparrow	*Passer domesticus*							■	■	
Jay	*Garrulus glandarius*		■	■		■	■	■	■	
Kestrel	*Falco tinnunculus*		■	■		■	■			■

Table 3 – Birds recorded on LU property since 1999 – continued

		Bakerloo	Central	District	H&C	Jubilee	Met	Northern	Piccadilly	Victoria
Lesser whitethroat	*Sylvia curruca*			■						
Little grebe	*Tachybaptus ruficollis*							■		
Linnet	*Carduelis cannabina*						■		■	
Long-tailed tit	*Aegithalos caudatus*		■				■	■	■	
Magpie	*Pica pica*		■	■		■	■	■	■	
Moorhen	*Gallinula chloropus*							■		
Pied wagtail	*Motacilla alba*					■				
Robin	*Erithacus rubecula*			■		■	■	■	■	
Song Thrush	*Turdus philomelos*			■			■	■		
Sparrowhawk	*Accipiter nisus*					■	■	■	■	
Starling	*Sturnus vulgaris*		■	■		■	■		■	
Swallow	*Hirundo rustica*						■		■	
Swift	*Apus apus*									
Wheatear	*Oenanthe oenanthe*					■				
Whitethroat	*Sylvia communis*						■			
Willow warbler	*Phylloscopus trochilus*		■					■		
Woodpidgeon	*Columba palumbus*		■	■		■	■	■	■	
Wren	*Troglodytes troglodytes*		■	■		■	■	■	■	
Wryneck	*Jynx torquilla*		■							
Yellow Wagtail	*Motacilla flava*		■							

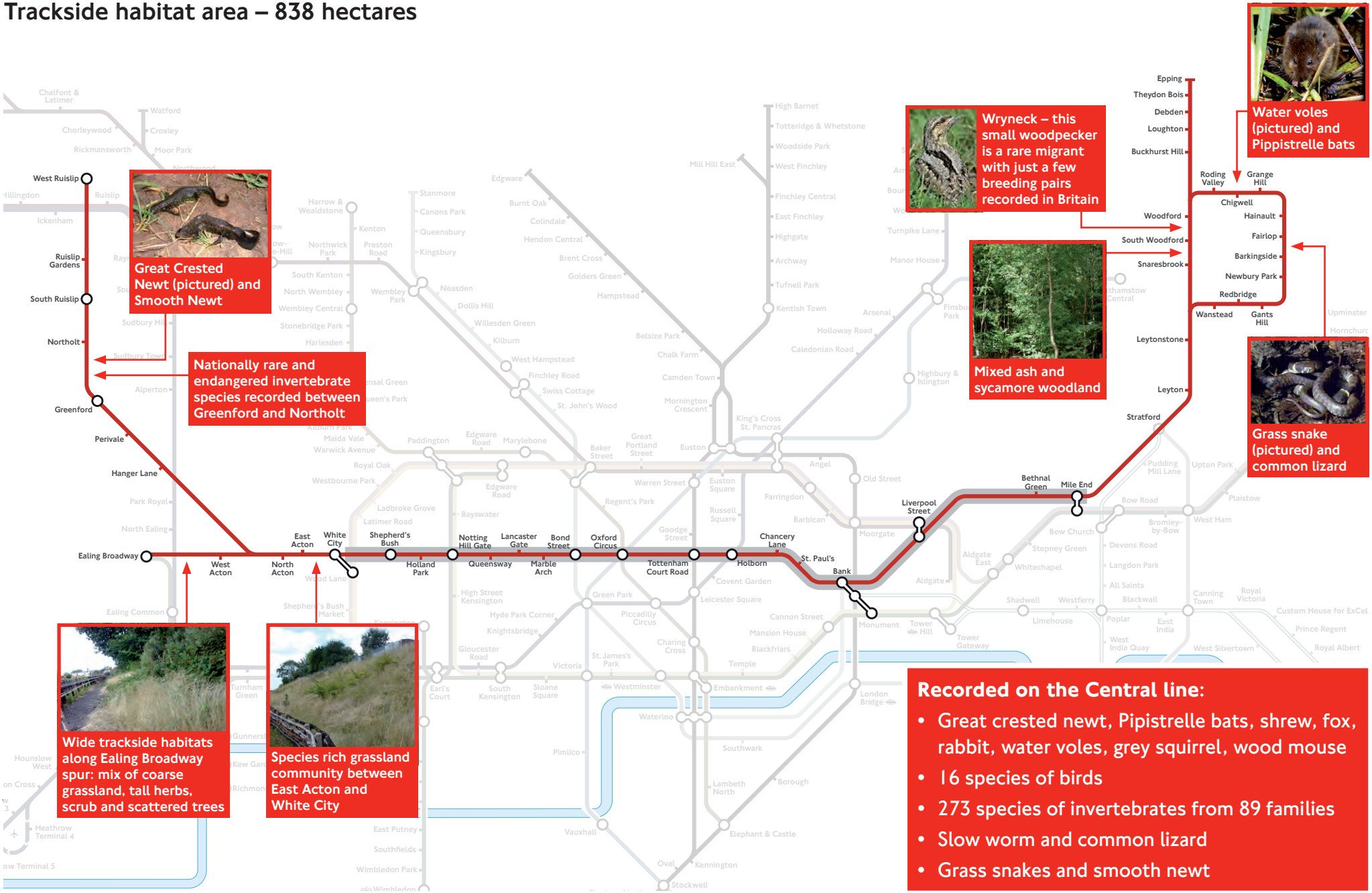
Most of the habitats on LU property are 'semi-natural', although habitats range from ancient woodland to maturing wasteland. Some of the important habitat types present on LU property include acid grassland, mature broad-leaved woodland, woodland habitat in central London and species-rich grassland. The predominant habitats noted were woodland, grassland and scrubland although other habitats such as wasteland and wetlands were also recorded.

3.2 Biodiversity highlights

The following line diagrams note some of the biodiversity highlights which have been recorded on LU property over the past 10 years. The diagrams follow the London Underground network map and are not geographically correct. Not all species and habitats recorded on London Underground property have been highlighted on the diagrams. Photos have been used to illustrate the line diagrams; not all of the photos were taken at the site referred to.

Central line

Trackside habitat area – 838 hectares



Recorded on the Central line:

- Great crested newt, Pipistrelle bats, shrew, fox, rabbit, water voles, grey squirrel, wood mouse
- 16 species of birds
- 273 species of invertebrates from 89 families
- Slow worm and common lizard
- Grass snakes and smooth newt

District line

Trackside habitat area – 387 hectares

Richmond branch is managed by Network Rail

Woodland and scrub

Smooth Newt

Mixed broadleaf woodland

Species rich grassland

Great Crested Newt

Grass snake, slow worm (pictured) and common lizard

Water voles

Endangered Carder bumblebee

Recorded on the District line:

- Wood mouse, fox and rabbit
- 16 species of birds
- 273 species of invertebrates from 89 families
- Slow worm and common lizard
- Grass snakes and smooth newt

Trackside habitat area – 310 hectares

Oak and birch woodland

Cornflower (UK BAP Species)

Mixed broadleaved woodland with areas of tall herbs

Longheaded poppy (notable London species)

Developing wasteland plant community

Recorded on the Jubilee line:

- Field voles, rabbit, mole, wood mouse and fox
- 17 species of birds
- 96 species of invertebrates from 43 families

Metropolitan line

Trackside habitat area – 1120 hectares

High quality mature mixed broadleaved woodland, including areas with ancient woodland characteristics, e.g. dog's mercury.

Badger (pictured), wood mouse and smooth newt

Slow worm (pictured), common lizard and badger

Bats (pictured), water vole, smooth newt and grass snake

Extensive Great Crested Newt population close to Ruislip depot

Grass snakes (pictured), slow worm and common lizard

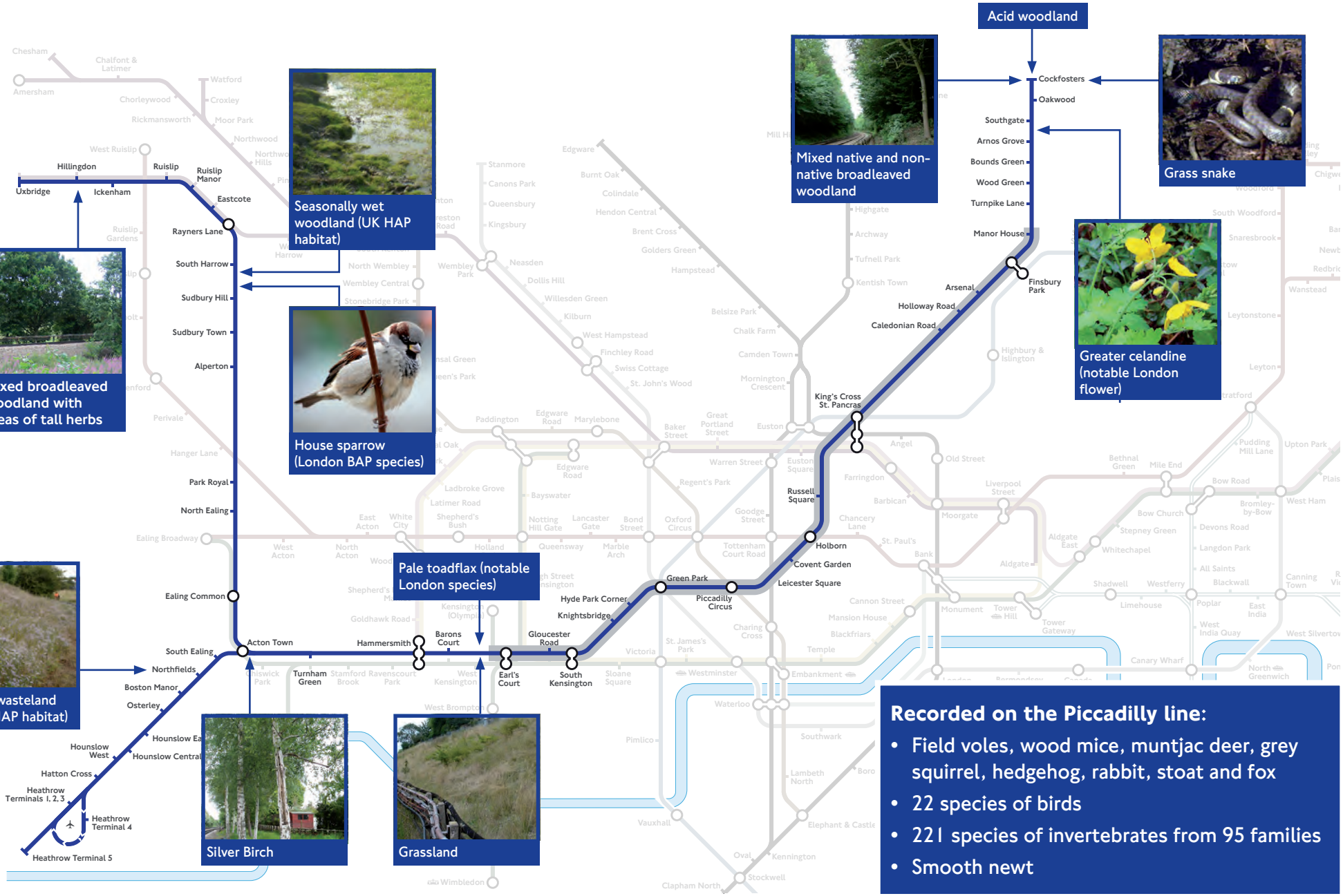
Great crested newt and smooth newt (pictured)

Recorded on the Metropolitan line:

- Pipistrelle and Daubenton's bats, badgers, grey squirrel, common rat, mole, rabbit, stoat, wood mouse and fox
- 27 species of birds
- 266 species of invertebrates from 94 families
- Great crested newt and smooth newt
- Slow worm and grass snake

Piccadilly line

Trackside habitat area – 770 hectares



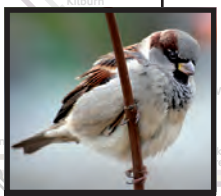
Recorded on the Piccadilly line:

- Field voles, wood mice, muntjac deer, grey squirrel, hedgehog, rabbit, stoat and fox
- 22 species of birds
- 221 species of invertebrates from 95 families
- Smooth newt

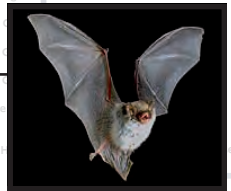
Northern line

Trackside habitat area – 470 hectares

One of few wetland sites on the network is dominated by common wetland birds: moorhens, warblers and the little grebe

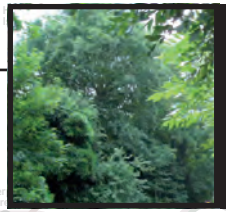


House sparrow (London BAP species)



Natterer's (pictured), Pipistrelle and Daubenton's bats

Common orchid growing on artificial substrate



A disused spur colonised by species found in Highgate Wood provides an important refuge to plant and animal species which are sensitive to disturbance

Wasteland (London HAP habitat)

Small toadflax (notable London species)

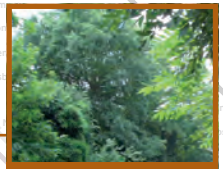
Recorded on the Northern line:

- Pipistrelle and Natterer's bats, grey squirrel, brown rat, and fox
- 18 species of birds
- 178 species of invertebrates from 69 families
- Slow worm and common frog

Bakerloo line

Trackside habitat area – 1.3 hectares

Slow worm (pictured) and common lizard



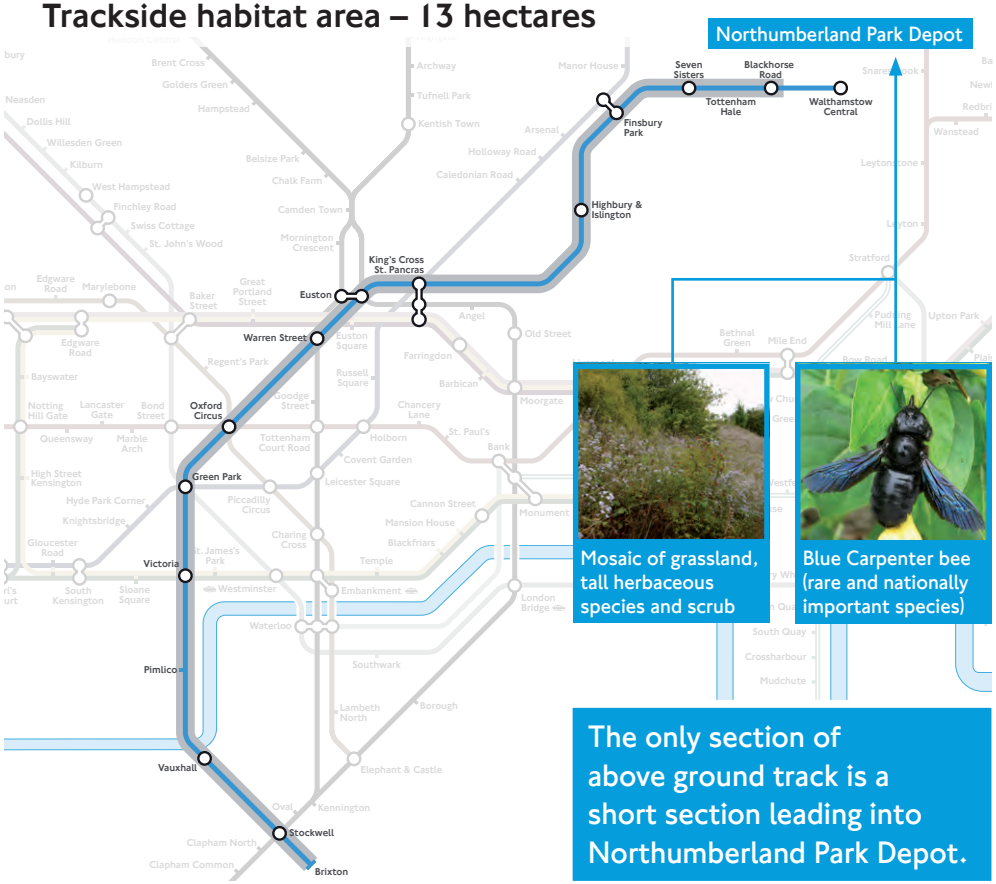
Assorted woodland and scrub, including hawthorn, sycamore and birch

Wembley brook runs along northern edge of Stonebridge Park depot (in concrete channel)

The majority of above ground track is owned and managed by Network Rail. LU manages two overground sections of track – around Queen's Park station and Stonebridge Park Depot.

Victoria line

Trackside habitat area – 13 hectares



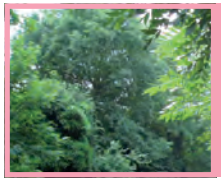
Mosaic of grassland, tall herbaceous species and scrub

Blue Carpenter bee (rare and nationally important species)

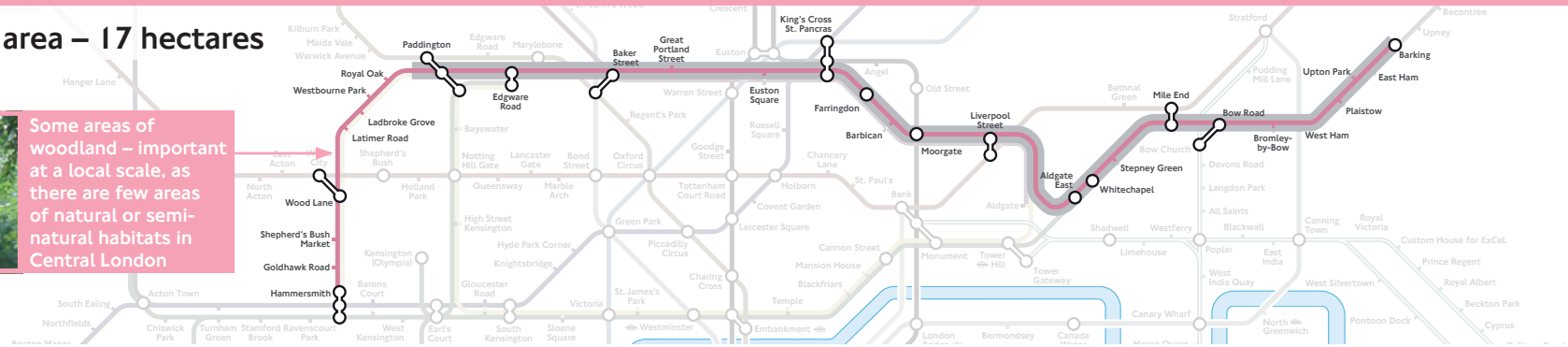
The only section of above ground track is a short section leading into Northumberland Park Depot.

Hammersmith and City line

Trackside habitat area – 17 hectares



Some areas of woodland – important at a local scale, as there are few areas of natural or semi-natural habitats in Central London



3.3 Biodiversity value of the LU network

Landscape-scale conservation means consolidating and expanding valuable or threatened habitats, and creating new habitat areas. The larger an area of habitat is the more plant and animal species will be found on it and the larger populations of each species. The bigger a local population is, the less chance there is of it becoming locally extinct. Providing larger blocks of natural and semi-natural habitats, will also increase the ecosystem services they provide.

Wildlife corridors and stepping-stones are key to landscape-scale conservation too. These will help wildlife adapt to climate change, by enabling them to move around the country safely to new suitable habitats as the south of the UK warms. LU property has already been identified as an essential green corridor for London's wildlife in the Mayor's Biodiversity Strategy which states that it provides "an excellent network of green space throughout the capital".

The biodiversity importance of LU's lineside environments varies depending upon the areas of surrounding land that they pass through. In areas such as the inner London boroughs, railway linesides can provide habitats that are not present elsewhere in the borough due to the pressures of urban development. In addition, the loss of Brownfield sites (or open mosaic habitats on previously developed land) within London to development means that the importance of lineside habitats are increased as ecological resources elsewhere are even more limited. Brownfield habitats are now recognised as nationally important, scarce habitats of exceptionally high biodiversity value. Railway linesides are therefore very important as in many cases they replicate the characteristics of this habitat type.

Our extensive portfolio of operational, disused and non-operational property supports significant areas of biodiversity in London. Over 800 hectares of trackside at 200 sites on LU's network have been identified as Sites of Importance for Nature Conservation (SINC). Although there are no Sites of Special Scientific Interest present on LU's network, the Metropolitan line bisects the Croxley Common Moor SSSI near Croxley, an important Hertfordshire acid grassland and heathland area. A number of trackside areas such as Gunnersbury Triangle in Chiswick are actively managed as nature reserves.

The Central line runs close to, and in some areas immediately adjacent to sections of Epping Forest SSSI, which is also designated a Special Area of Conservation (SAC) which is located between Woodford and Buckhurst Hill and Leytonstone and Snaresbrook. Pondsfield Park Site of Importance for Nature Conservation (SINC) is located between Dagenham Heathway and Dagenham East on the District line, has been designated for the small areas of acid grasslands present. Roxbourne Park SINC located between Rayners Lane and Eastcote on the Metropolitan line includes both acid and neutral grasslands.

A wide variety of mammal, reptile, amphibian and invertebrate species were recorded on

LU property during surveys, some of which are of national, regional or local biodiversity importance. Over 550 plant species, 42 bird species, 14 mammals, 538 invertebrate species, 3 reptile species and 3 amphibian species have been recorded on LU land. A number of these are legally protected or locally important animal species, including bats, wryneck, great crested newts, stag beetles, slowworms, water voles, native goldenrod, common orchid and bluebells.

Predictably, the potential contribution of underground tunnels and track areas to such conservation is limited. The dark environment holds little scope for safe survival of most animals and plants. Built structures above ground, or partly exposed at or between stations, do contribute, providing refuges where particular plants or animals are able to thrive.

3.4 Vegetation management

Non-native pest species of plants and animals may be found on our network. Oak Processionary Moths and their larvae were introduced to Britain around the Richmond area a few years ago. Eradication plans developed with all stakeholders involved and the Forestry Commission are still ongoing. Two plant species that have a negative impact on biodiversity, Japanese Knotweed and giant hogweed, are present too. This publication will be used to help monitor the effectiveness in reducing these species on our property.

For safety reasons, access to operational railway land is restricted, leaving wildlife relatively undisturbed apart from maintenance activities and the passage of trains. However, as long as the safe performance of the railway is not affected in any way, lineside land can provide important secluded areas as refuges for wildlife, especially species that elsewhere may be vulnerable to human disturbance.

Two key elements of LU's activities to maintain and renew the London Underground network have the potential to impact biodiversity, namely vegetation maintenance and project works that involve vegetation clearance. It is by making subtle changes to these two practices that LU has the best opportunities to make improvements to lineside biodiversity, without increasing costs.

The regular control of vegetation is essential to protect fence lines, embankments, cutting slopes and the track infrastructure from the effects of encroachment by vegetation as well as to control the spread of invasive and injurious plant species. Vegetation maintenance is necessary to prevent future problems associated with the growth of vegetation that can negatively affect the efficient running of the operational railway. For example, problems can arise from leaf fall on rails, trees and branches falling onto the track or obscuring signals, and vegetation can affect the stability of slopes in cuttings and embankments.

Project works, such as embankment and cutting stabilisation schemes, track renewals, drainage works, and occasionally station works, also have the potential to impact upon the wildlife along the track. All works are undertaken to ensure that protected species are not affected during works. For example, when Metropolitan line track

renewal works were planned in Amersham, a badger sett was identified within the vicinity of the worksite and a licence was obtained for the works, which were carried out with an ecologist present to minimise impacts.

Following works that require the removal of significant amounts of vegetation, landscaping is undertaken. Landscaping can play an essential part in maintaining slope stability once root structures have been established and can benefit local residents who live adjacent to the track. So important is landscaping to LU operations that specifications, which are applicable to all contractors undertaking any works on the network, are mandated in a Landscaping and Vegetation standard.

However, it is not always possible to have a positive impact on the biodiversity. Where

diseased or damaged trees threaten the safe running of the railway, they are removed. Some trees and animals, e.g. Badgers that live close to the track, may undermine embankment stability. In these cases, LU will work with the relevant authorities to ensure that our activities are carried out in a sensitive manner and minimise disturbance as much as is reasonably practical.

London Underground's Health Safety and Environmental Policy commits LU to actively supporting the Mayor's Biodiversity Strategy. There are clear standards for manageing LU property which requires that all trees, shrubs and flowers planted are compatible with the operation of the railway, encourage species diversity and enhance the landscape. LU monitors activities regulalry and requires that any environmental incidents which could adversely affect biodiversity to be reported and investigated.

3.5 Access to greenspaces

As well as the significant role LU play in managing this property, LU also has the opportunity to increase Londoners' awareness of both the biodiversity value of LU property and the transport service provided to intersting habitats and species across London, such as Hampstead Heath, Kew Gardens and Camley Street Natural Park

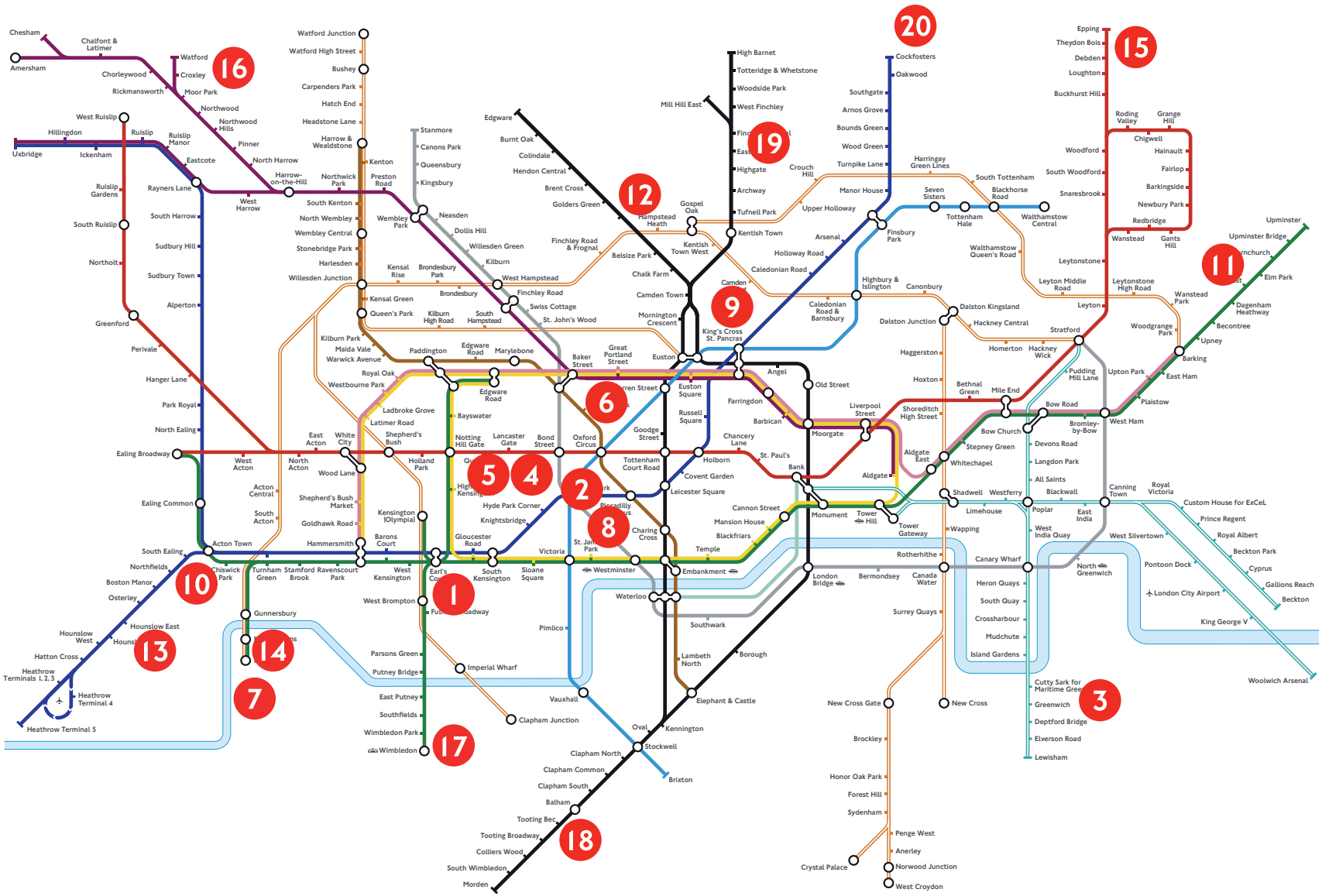
Open spaces, whether a park or common, playing fields or a golf course, allotments or a civic square, are important to the quality of life of all London's residents. They are key features of the

capital, providing areas for tourism, relaxation, sport and recreation, aiding the mitigation of climate changes and even boosting the economy of their local areas. The importance of open spaces to London is recognised in the Draft Replacement London Plan and the Mayor's Transport Strategy, where numerous policies provide for improved access to, as well as their protection and management of open spaces.

A recent report by Commission of Architecture and the Built Enviornment (CABE), states that "access to decent green space, alongside housing, health and education, is a basic requirement for a good quality of life" (taken from *'Community Green: using local spaces to tackle inequality and improve health, 2010'*). London's Tube network is important in providing access to green spaces, particularly the larger parks and open spaces. In the future GiGL LU hope to be able to provide travelling times to publicly accessible open spaces. These will be based on accurate distances along paths and roads from e.g. park access points to a Tube station.

London's publicly accessible open spaces are categorised in a hierarchy according to their size. For each category, the Greater London Authority has provided a maximum distance a London resident should be from that category of open space, for example one kilometre walking distance from a publicly accessible Site of Borough or Metropolitan Importance for Nature Conservation. Areas outside of these distances are classified as deficient in access to public open space. However, although an area may be deficient in term of travel distance to a publicly accessible open space, it may not be in terms of travel time using the Tube.

Royal parks, nature reserves and green areas in London



Royal Parks

1. Brompton Cemetery
2. Green Park
3. Greenwich Park
4. Hyde Park
5. Kensington Gardens
6. Regents Park
7. Richmond Park
8. St James's Park

London Wildlife Trust Nature Reserves

9. Camley Street Natural Park
10. Gunnersbury Triangle
11. The Chase

Other Green Areas

12. Hampstead Heath
13. Syon Park
14. Kew Gardens
15. Epping Forest
16. Croxley Common Moor SSSI
17. Wimbledon Common
18. Tooting Bec Common
19. Highgate Wood
20. Trent Park

4. LU BAP Achievements

This section highlights just some of our achievements on the way to meeting the biodiversity objectives published in our first BAP in 2007.

4.1 Surveys and data

London Underground regularly surveys its property – either across specific areas of the network or site-specifically in advance of planned works. A biodiversity survey of all London Underground tracksides was published in 2000. The survey identified all trackside habitats, with more detailed surveys of plant and animal species were carried out at specific sites. Further surveys in 2005–06 have helped to understand the biodiversity value of LU property and contributed to the development of the LU BAP launched in 2007.

Information from all surveys has been shared with GiGL. Access to GiGL data means that LU also has information about habitats bordering its property in all London Boroughs. This is essential when planning site access to and from projects.

Within LU, survey information is available to employees via the geographical information system (GIS). The GIS is an essential planning tool that enables the habitat type, quality (high, medium and low) and presence or potential presence of protected species at a particular area, to be identified in advance of work. This information, and supporting ecology guidance, has been used by projects to manage access to work sites, guide reinstatement works and management practices across the network.

LU uses a variety of other tools to manage biodiversity issues including legal compliance. At their core is the LU Environment Strategy 2008–2013 with objectives to:

- conserve, and where reasonably practical to enhance, the biodiversity value of LU property
- increase awareness amongst staff and the travelling public of biodiversity in London

To help fulfil its first objective LU developed and published its first BAP. Made publicly available, it outlined the biodiversity resource provided by the lines, stations, depots and sidings managed by LU and its contractors. It identified the priority species and habitats, important in conservation terms, and explained the actions LU, and its contractors, would take to protect, conserve and enhance biodiversity within the context of upgrading and running the railway until the BAP was reviewed this year in 2010. The 2010 review aligns the LU BAP with the current conservation principle of landscape-scale conservation, as well as continuing to conserve and protect the species and habitats indentified in the first BAP where possible.

LU worked closely with London-based and national conservation bodies, such as the London Biodiversity Partnership and Natural England to produce the first BAP; and called on their support for the 2010 update too. Indeed, Natural England welcomed LU's commitment to protecting biodiversity noting that it was good news for wildlife and for the people of London.

4.2 Living roofs

When the BAP was published in 2007, LU had just one living roof at the Northern line Service Control Centre. Now three more have been installed on the Brixton Train Crew Accommodation building, the Stratford Train Crew Accommodation building and one, with integrated electricity-generating solar panels, has been installed at LU head office building at 55 Broadway. TfL installed this roof in association with Buglife – The Invertebrate Conservation Trust & Livingroofs.org with funding through SITA Trust's Enriching Nature Programme. Buglife is carrying out a 3 year research project monitoring the living roof as part of research to see to what extent living roofs have helped support certain species of invertebrates.

So far, the project has shown that, just within its first year, the roof is teaming with insect life. The most prolific and noticeable being pollinating insects, bees and Lepidoptera. In January 2010, native bulbs such as crocus, daffodils and hyacinths were planted to help insects with early pollen, successfully providing a feeding ground for insects as early as February. Cornflower, oxeye daisy, camomile, corn cockle poppies carpeted the roof. Red and white tailed bumble bees, as well as early and brown carder bumble bees were all recorded feeding on the roof during summer 2010.

Spiders such as money spiders, jumping spiders and crab spiders, together with some beetles such as ladybirds and ground beetles already occupy the roof habitat within the first year. Bees still make use of the pollen provided by the wildflower rich roof during autumn. This is because at ground level, in parks for instance, wildflowers have mostly died out, whilst living roofs, in many cases, experience a second flowering in late August, early autumn. This year has been particularly harsh on green roofs because of the frosts and snows in January, drought in April and summertime. The roof as designed and installed has really stood up to the challenges of such weather.

LU will continue to maintain all of our living roofs to maximise their potential for nature. We will also consider the possibility of living walls and roofs in new projects by incorporating them in the Project Management Framework, the processes by which we manage and deliver all projects.

4.3 Managing the biodiversity value of LU property

Landscaping and replanting after major works has meant LU have been able to make a positive contribution towards biodiversity along the network by providing optimum habitat for fauna and flora. Ecologists, either from Natural England or specialist contractors, are consulted whenever creating landscaping plans or obtaining licenses, ensuring appropriate enhancement measures are put in place to encourage locally important or protected species and habitats.

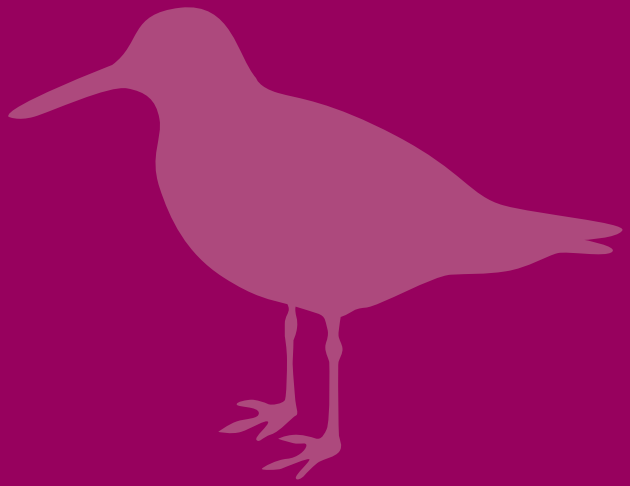
In an extensive £7.5 million scheme to stabilise embankments and cutting slopes on the section of track between Hillingdon and Uxbridge stations, shared by the Metropolitan and Piccadilly lines, a number of simple but effective biodiversity enhancement measures were implemented.

Island Barn Reservoir

Around 6,800 tonnes of clay excavated from the LU Step Free Access Project at Green Park station has been sent by contractor Tube Lines to help restore a haven for wild birds just south of the Thames at West Moseley in Surrey. Diverting the clay from landfill has saved over £¼million in landfill tax.

Island Barn Reservoir covers 49 hectares, its enclosed artificial banks have the River Ember running to its south and east and the River Mole to its west and north. The reservoir lies within the Borough of Elmbridge and is managed by Thames Water.

The site has been identified of being of international importance for wintering waterfowl and is known for rare grebes, sea ducks and divers in winter and for waders on passage and in winter.



Stag beetle 'loggeries' were installed in an adjacent grassland meadow which had already been colonised by stag beetles. Great crested newt hibernacula were also created in adjacent areas to the track under a licence agreed with Natural England.

A continuous line of mature trees were maintained throughout the works at the base of embankment slopes, and once the stabilisation works were completed, native wildflower seed mix and native shrubs were used to re-establish the vegetation, creating a woodland edge type effect. This has provided an excellent habitat for invertebrates such as butterflies.

The establishment of a nature area between Kingsbury and Wembley Park, by our contractor Tube Lines, has allowed the development of a variety of habitats. The site has been seeded with a variety of native wildflower seeds and replanted with shrubs and trees, to enable native wildlife to flourish. A number of different habitat areas have been installed, including solitary bee boxes, woodpecker boxes, barn owl boxes, field mouse and dormouse habitats, and hedgehog habitat. A reptile watering area, which includes an innovative reptile basking area, has also been installed. Logs from the site that have been felled have been stacked on-site to provide a habitat for fungi and beetles, a vital food source for birds. The embankment continues to be monitored to see what else moves into the area.

4.4 Raising awareness

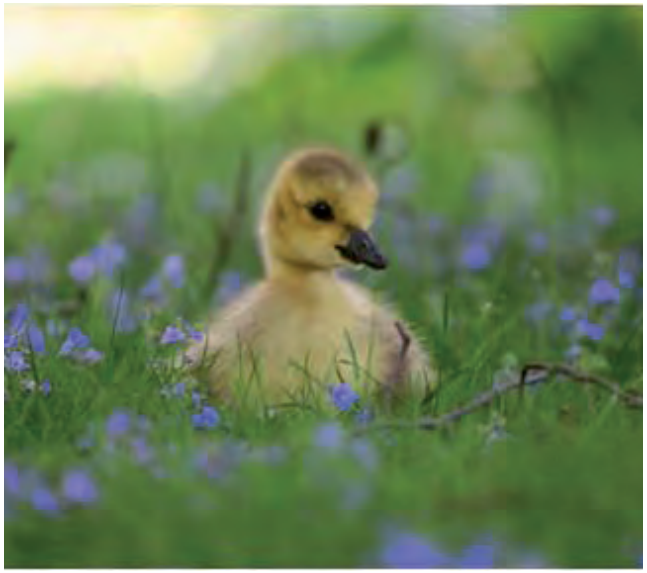
LU carries over 1 billion passengers each year and, combined with around 19,000 members of staff, this means that LU can play a central role in raising awareness of biodiversity and the ecosystem services it provides London and

Highgate Bats

The colonies of Brown Long Eared, Natterer's and Daubenton's bats living in disused tunnels in Highgate, where work with the London Bat Group has seen population levels rise ten-fold since 2002–03.

Londoners. To meet its second objective, LU uses internal and external publications, such as staff magazines and the Metro newspaper, and awareness raising campaigns and competitions, not only to promote interest in the environment but also to promote the access the Tube provides for visiting greenspaces in London.

LU has established a strong working relationship with the Royal Society for the Protection of Birds to raise awareness in London. In 2009, LU and RSPB worked together to run the successful "Mind the Bird" photograph competition. The 2010 LU-RSPB 'Life Between the Lines' photograph and projects competition includes categories for individual employees and the public but has also been extended for community groups. These cost-effective competitions use new media to raise awareness of London's rich wildlife, and promote LU as a means to explore and discover the Capital's natural wonders. It also provides LU with an opportunity to showcase the biodiversity benefits of its approach to land management.



London Underground also provides significant access to green spaces around London. This access is promoted each year through the Oystercatcher Bird Race, organised by Natural England and supported by TfL. Here teams from different organisations visit different wildlife sites and greenspaces within London, using only public transport, to spot as many bird species as possible

Within LU, the Underground in Bloom competition becomes more and more successful every year. Over 50 locations now take part with representatives from all lines. Some unexpected surprises can turn up in station gardens, such as stag beetles and slow worms and entrants are encouraged to look for opportunities to encourage wildlife and also to monitor and record wildlife sightings in their gardens. The competition actively encourages staff to consider entries which promote wildlife and habitats and reduce other environmental impacts, such as water use. London's Capital Growth scheme, which aims to add new growing spaces in London by 2012 increasing the amount of locally grown fruit and vegetables in the city, has inspired the addition of a new Fruit and Vegetables category in the competition too.

5. LU BAP Actions

5.1 Outline

The Underground provides excellent habitat resources over ground, not only for the wealth of flora and fauna able to flourish, but also for Londoners. LU has an important job to educate its employees and the public in a fun and interesting way, as well to continually improve its land management practices so that the biodiversity of its network increases despite challenges such as climate change. Enhancing biodiversity is a vital part of being a world-class Tube for a world-class city.

The BAP will help manage biodiversity as LU continue to invest in the network. It will ensure LU meets the objectives of TfL's environment Strategy objective to maintain and where possible enhance the quality of London's natural environment, the LU Environmental Strategy and the Mayor's Biodiversity Strategy, and assist in the delivery of national BAP targets. The new strategy actions also support the shift in ecology and habitat management methods to landscape-scale conservation schemes such as those developed by Natural England and its partners as well as the All London Green Grid.

The following section sets out action plans for habitats and protected species on LU's network, using specific measurable actions we will undertake, with our partners, to manage biodiversity on our property. The new BAP strategy actions will run to 2016, when any resurveying of our property needed to comply with the Mayor's Biodiversity Strategy will begin.

5.2 Protected species

Wide varieties of mammals, reptiles, amphibians and invertebrate species have been recorded on London Underground's property. A number have been identified as protected species for which individual or group action plans have been developed. These species are bats, badgers, reptiles, stag beetles and water voles. The criteria for selection included:

- Species has been recorded or is likely to be present on the LU network;
- Species is included in the London Biodiversity Action Plan; and/or
- Species receives legal protection under the national legislative framework

We will continue to work with our contractors and biodiversity partners to:

1. **Conserve protected species and enhance protected species habitats on London Underground property by:**

- Maintaining records of protected species found on LU property
- Providing information on the presence of protected species on LU network to LBP and GiGL
- Protecting and enhancing protected species and their habitat on London Underground property where practical

2. Increase awareness amongst our staff, customers and public of the presence and value of protected species found in London by:

- Including specific elements in London Underground's biodiversity communication plan on protected species known to be present on the network
- Providing LU staff with information on protected species and their habitats known to be present on network

5.3 Habitat conservation and enhancement

Changing management style to support landscape-scale conservation planned for areas such as the Thames and Tributaries areas of Greater London and RSPB Futurescapes will extend and conserve priority habitats in London; and help maintain the ecosystem services they provide Londoners. We plan to identify new opportunities in our investment projects and improve our maintenance regimes to deliver biodiversity benefits in a cost effective manner for LU.

1. To conserve, enhance and increase the quantity of priority BAP habitat on London Underground property

New opportunities

Using GiGL habitat suitability maps, identify areas of LU property with potential for enhancement	Lead: LU Support: GiGL	2011
For areas of LU property identified as having potential for habitat enhancement, confirm and record suitability (e.g. cost, safety) for habitat enhancement	Lead: LU	2011 to 2012
Use GiGL to monitor area of priority BAP habitat land added to LU property	Lead: GiGL Support: LU	2012 to 2017

Improving project planning

Develop and communicate reinstatement plans for Capital Programme works based on habitat suitability maps	Lead: LU HSQE Directorate Support: LU Strategy and Commercial Directorate and LU Capital Programmes Directorate	2012 to 2013

Improving maintenance regime

Develop and communicate habitat management plans for day to day maintenance based on habitat suitability maps	Lead: LU HSQE Directorate Support: Maintenance Directorate	2013 to 2014

2. To maintain and develop the wildlife potential on current and new LU buildings

Ensure the potential for living walls and roofs are considered as part of the Project Management Framework	Lead: LU Capital Programme Directorate Support: LU Strategy and Commercial Directorate and LU HSQE	2011 to 2012
Maintain the green roofs currently on LU property	Lead: TfL Group Property and Facilities and Tube Lines Limited	ongoing

3. Review LU's Biodiversity Action Plan in 2017

To produce a revised Biodiversity Action Plan for London Underground	Lead: LU HSQE Directorate	2017

We will continue to:

- work with our contractors and biodiversity partners to provide our staff, customers and public with information on BAP habitat on LU property and across London as a whole

5.4 Invasive species management

Unfortunately, as well as having a cornucopia of protected species, several non-native and invasive species are also present across our network, which out compete native species and damage our infrastructure. Plants such as Japanese Knotweed and Giant Hogweed, and pests such as Oak Processionary Moths and their larvae, are legally controlled and require careful management to protect native flora and fauna and conserve the integrity and biodiversity value of our property.

1. To reduce Japanese Knotweed on LU property

Implement standardised methodology for invasive species management across all lines under LU control

Identify and document best practice management and apply to all lines under LU control	Lead: LU HSQE Directorate Support: LU Maintenance Directorate	2010 to 2012
Monitor effectiveness through Invasive Weed Tracker	Lead: LU Maintenance Directorate Support: LU HSQE Directorate	2011 to 2012 and ongoing

2. Eradicate Giant Hogweed on LU property

Confirm areas of Giant Hogweed and implement eradication plan	Lead: LU HSQE Directorate Support: LU Maintenance Directorate	2010 to 2011

Monitor effectiveness through Invasive Weed Tracker	Lead: LU Maintenance Directorate Support: LU HSQE Directorate	2011 to 2012 and ongoing

3. Work with the Forestry Commission to control Oak Processionary Moths on LU property

Ensure best practice controls are developed and implemented for treatment of Oak Processionary Moths on LU Property	Lead: LU HSQE Directorate Support: LU Maintenance Directorate	2010 to 2011 and ongoing
Co-ordinate treatment with other Stakeholders affected by Oak Processionary Moths to improve effectiveness of treatment	Lead: LU Maintenance Directorate Support: LU HSQE Directorate	ongoing during treatment season
Actively take part in Oak Processionary Moth Stakeholder group to share best practice	Lead: LU HSQE Directorate Support: LU Maintenance Directorate	ongoing during treatment season
Keep Stakeholder group and Forestry Commission updated with treatment plan	Lead: LU Maintenance Directorate Support: LU HSQE Directorate	ongoing during treatment season

5.5 Ecology surveys and data collection strategy

The London Underground network stretches from the Chiltern Hills in Buckinghamshire in the West to Epping Forest in Essex in the East. It comprises around 400 km of track representing about 4000 hectares of land or approximately a tenth of the green space in the capital.

It is essential that we maintain up to date ecology information of our property portfolio so that we can continue to effectively balance enhancing the biodiversity value of our property whilst running a safe and reliable train service for London.

1. Resurvey LU's above ground property as per Mayor's Biodiversity Strategy, and record information for use by employees and contractors

Develop strategy for implementing LU's next ecology surveys as per Mayor's Strategy, in a cost effective way, for 2015–2016	Lead: LU HSQE Directorate	2016
Implement strategy	Lead: LU HSQE Directorate Support: LU Maintenance and Capital Programme Directorates	2016

2. To maintain a good knowledge of the biodiversity value of LU property

Improve current systems used to record the presence of plant and animal species on LU property by developing and maintaining a process which will allow staff to report presence of plant or animal species observed on LU property	Lead: LU HSQE Directorate Support: LU Maintenance Directorate and	2011

We will continue to:

- Develop and maintain a process to record information provided to LU by third parties
- Input LU biodiversity data into GiGL database

5.6 Awareness

Since 2007, we have used communication tools, such as staff magazines, competitions and our intranet site to raise awareness of biodiversity issues with our employees. We have also worked in partnership with national conservation bodies to engage with Londoners to raise awareness of biodiversity value and access to greenspaces.

We will continue to:

- Increase understanding amongst our staff of the importance of biodiversity conservation in London
- Work in partnership with conservation bodies to raise the profile of biodiversity conservation and its value, as well as how to access greenspaces around Greater London

Appendix 1: Reference and useful material

DEFRA (1994) Biodiversity. The UK Action Plan HMSO

London Biodiversity Partnership (2005) Action for biodiversity. Supporting the London Biodiversity Action Plan

London Underground (2000) Biodiversity survey report

Guest, P, Jones, K E and Tovey, J. (2002). Bats in Greater London: unique evidence of a decline over 15 years. British Wildlife, 14 (1).

Mayor of London (2002) Connecting with London's nature; The Mayor's Biodiversity Strategy Greater London Authority

Ecology Survey: Phase One SSL and BCV (2005)

Ecology Survey: Phase Two SSL and BCV (2006)

Tube Lines (2006) Phase One (plus) Survey of Tube Lines Jubilee, Northern and Piccadilly, depots and sidings

London Wildlife Trust – A Living Landscape

London Wildlife Trust – London's Natural Values

London Wildlife Trust – Strategic Plan 2010–2015

Natural England – Identification and Development of Integrated Biodiversity Delivery Areas (IBDAs) April 2010

Defra – Making Space for Wildlife September 2010

Defra – Adapting to Climate Change March 2010

Appendix 2: Glossary

Acid grassland	Acid describes the underlying usually rocky soil composition. It is relatively species poor and would turn into heath if not managed
All London Green Grid	A multi-functional network of green infrastructure and open spaces to help shape and support sustainable communities, and tackle climate change, e.g. by reducing flood risk and enhancing surface water management, in London. It will provide areas for recreational use, promoting healthy living, as well as areas for wildlife conservation.
Ancient woodland	Long-established woodland that has often developed a rich plant and animal life. Ancient woodland is defined as that known to have existed at a specific location since before 1600 AD.
Badger sett	Any structure or place which displays signs indicating current use by a badger (these include sheds, culverts, concrete pipes, derelict buildings, etc.).
Bat roost	Any structure or place which is used by bats for shelter or protection.
Biodiversity	The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity. Biodiversity is of value in its own right and has social and economic value for human society.
Biodiversity Acton Plan (BAP)	A framework for achieving the conservation of biodiversity based on the targeting of resources towards priority habitats and species. BAPs can be prepared at a range of levels: national (e.g. the UK BAP), for regional areas (e.g. London BAP), for local authorities (e.g. Islington BAP) as well as for businesses (e.g. London Underground BAP).
Bird nest	Any structure or place nest where birds lay their eggs and hatch their young.
Broadleaf woodland	Broadleaf woodland is composed of trees with leaves which are not needle-like. The leaves of different broadleaf trees come in all varieties of shapes and sizes, but tend to be flat; broad shapes quite unlike the needles of conifers. Most broadleaf trees in Britain are deciduous. This means that they lose all their leaves in the autumn, remaining bare through the cold winter months until the spring, when they grow new foliage.
Brownfield	Or Open Mosaic Habitat on Previously Developed Land, is any land or premises which has previously been used or developed and is not currently in full use, although it may be partially occupied or utilised. The land may also be vacant, derelict or contaminated. This excludes parks, recreation grounds, allotments and land where the remains of previous use have blended into the landscape, or have been overtaken by nature conservation value or amenity use and cannot be regarded as requiring redevelopment.

Calcareous grassland	Calcareous grassland is found on a chalk or limestone substrate. It attracts lime-loving plants such as upright brome, blue moor-grass and common rockrose that do not grow in other soils.
Channelisation	Altering the natural profile or course of a watercourse, making a watercourse more 'channel' like, through activities such as re-profiling or hard engineering of the banks.
Coniferous woodland	Coniferous woodland, as its name suggests, is made up predominantly of conifers. Conifer trees often having needle-like leaves, such as the familiar Christmas tree. They are usually evergreen, In other words, rather than shedding their needles all at one time in the autumn, they lose a proportion throughout the year, with these being constantly replaced. As a result, they always have foliage on them.
Conservation	Protection, management and promotion for the benefit of wild species and habitats, as well as the human communities that use and enjoy them.
Conservation (Natural Habitats & C.) Regulations 1994	The Conservation (Natural Habitats, & C.) Regulations 1994 transpose the Habitats Directive into domestic legislation. They apply to England, Wales and Scotland and their territorial seas up to 12 nautical miles from baseline.
Coppicing	The traditional form of management of much broadleaved woodland in the UK. It involves cutting down trees and shrubs near ground level, allowing the tree to form multi-stemmed re-growth, and re-cutting at intervals of up to one or more decades to provide a harvest of long poles.
Countryside and Rights of Way Act 2000 (CRoW)	The Countryside and Rights of Way Act 2000 (also known as CroW) amended the Wildlife and Countryside Act of 1981. It created a new statutory right of access to open country and registered common land, modernised the rights of way system, gave greater protection to Sites of Special Scientific Interest (SSSIs), provided better management arrangements for Areas of Outstanding Natural Beauty (AONBs), and strengthened wildlife enforcement legislation.
Cuttings	Where rail tracks have been dug into the earth or stone.
Depots	An area where trains are stabled and maintained and there is a Duty Manager.
Ecologist	A biologist who studies the relation between organisms and their environment.
Ecosystem	A community of organisms and their physical environment interacting as an ecological unit.
Ecosystem services	Services provided by the Earth's ecosystems to humanity, e.g. flood protection, improving quality of life etc.
Embankment	Long artificial mound of earth or stone at the side of railway lines.
Fauna	All the animal life in a particular region.
Flora	All the plant life in a particular region.
GLA	Greater London Authority

GiGL	Greenspace Information for Greater London is a partnership of approx 50 organisations including London Bat Group, London Natural History Society, the London Boroughs etc. that contribute their own ecology data. This in turn makes all their data available to GiGL subscribers, such as TfL, to use with their own survey information.
Greater London	The geographical area encompassed by the 32 London boroughs and the City of London.
Green corridors	Green corridors are relatively continuous areas of open space leading through the built environment, which may link sites to each other and to the Green Belt or Metropolitan Open Land. They often consist of railway embankments and cuttings, roadside verges, canals, parks and playing fields and rivers. They may allow animals and plants to be found further into the built-up area than would otherwise be the case and provide an extension to the habitats of the sites they join.
Habitat	The natural home of any plant, and where animals feed, breed and rest. Often used in the wider sense, referring to major assemblages of plants and animals found together such as woodlands or grasslands.
Habitat Acton Plan (HAP)	Action Plan providing detailed descriptions for a specific type of habitat and setting out detailed actions that can be taken by a number of agencies in order to safeguard and enhance a habitat.
Habitat Audit	Habitat Audits have been produced for 11 habitat types found in London. These audits define the habitat, describe the resource in London and identify the major threats and opportunities for conservation – data sources are listed and the rationale and limitations of approach outlined.
Habitat Suitability Maps	Habitat Suitability Maps identify areas where priority London BAP habitats, such as acid grassland and heath, may be restored or increased in size because the ecological conditions are suitable.
Hibernation	The torpid or resting state in which some animals pass the winter; cessation from or slowing of activity during the winter; especially slowing of metabolism in some animals.
Hibernacula	The shelter of a hibernating animal.
HSQE	Health, Safety, Quality and Environment
Integrated Biodiversity Development Areas	Large areas of land identified as a priority for biodiversity enhancement due to their existing biodiversity interest and / or where significant BAP delivery occurs
Invertebrate	An animal, such as an insect or mollusc that lacks a backbone or spinal column.
LBP	London Biodiversity Partnership
LU	London Underground
Off Track	Area from boundary to two metres of rails

Neutral grassland	Neutral grassland grows on soils with a neutral pH, and can be un- or semi-managed, moist, or waterlogged. They can support a range of grasses, herbs, and wildflowers.
Permanent Way	Area within 2 metres of any rail.
Pollarding	Pollarding is a woodland management method of encouraging lateral branches by cutting off a tree stem or minor branches two or three metres above ground level. The tree is then allowed to re-grow after the initial cutting.
Project Management Framework	Processes LU uses to implement and manage projects.
Secondary woodland	Woodland that has developed on a previously non-wooded site.
Sidings	Area where trains are stabled or reversed.
Site of Nature Conservation Importance (SINC)	A non-statutory site designated at local authority level for its nature conservation interest.
Site of Special Scientific Interest (SSSI)	An area of land notified under the Wildlife & Countryside Act 1981 as being of special national nature conversation interest. Sites are notified by Natural England in England.
Special Area of Conservation (SAC)	Sites designated under the 'The Conservation (Natural Habitats, & C.) Regulations, 1994 in conformance with the requirements of the EC Habitats Directive for the purpose of conserving habitats and species of European importance.
Species Acton Plan (SAP)	Action Plan providing detailed descriptions of a species and setting out detailed actions that can be taken by a number of agencies in order to safeguard and enhance a species.
Species-poor grassland	Grasslands with relatively low plant species diversity, that do not include varied species.
Species-rich grassland	Grasslands with relatively high plant species diversity, roughly with over 30 different species present.
Species diversity	The variety and relative number of species in an area
TfL	Transport for London
Tree Preservation Order (TPO)	An order made under the Town and Country Planning Act (1990), to preserve trees of high amenity value and to prevent felling or tree surgery without consent from the Local Planning Authority.
Wildlife and Countryside Act 1981	The Wildlife and Countryside Act 1981 is the principle mechanism for the legislative protection of wildlife in Great Britain. Part I gives protection to listed flora and fauna; Part II deals with the protection of Sites of Special Scientific Interest (SSSI) and Part III deals with Public Rights of Way.

LU Biodiversity Action Plan 2010

If there are enquiries please email **biodiversity@tube.tfl.gov.uk**