

The London Plan Habitat Targets

*a review of progress
and forward recommendations*

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New reedbeds at Woodberry Wetlands, Manor House © Don Lewis

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1. Executive summary

The current *London Plan* contains a policy commitment to securing gains for key habitats in under Policy 7.19 *Biodiversity and access to nature*¹. Supporting text and Table 7.3 (*London regional BAP habitat targets for 2020*) sets out in more detail the ambitions of this policy objective, which could be achieved at least in part through local plan policy and development control decisions over the period of the Plan. These targets were identified by the former London Biodiversity Partnership in 2008 and were based on what London could contribute to national targets set during the review of targets in the UK Biodiversity Action Plan in 2006².

Since establishing these habitat targets national policy has moved away from setting specific habitat targets. The most recent England biodiversity strategy, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra on 19 August 2011; it does not contain habitat targets at the national level which can be interrogated and transposed to the regional level³.

Consequently this report reviews the delivery of the habitat targets set out in the current London Plan and assesses whether an updated set of habitat targets is appropriate or necessary in light of the changed emphasis of national policy.

The review also endeavoured to identify whether there are clear links between achieving habitat targets and development decisions in order to determine whether land use planning policy in the London Plan is an effective and significant mechanism for securing habitat creation.

The review showed that several habitat targets have been met – or are in positive progress. However, robust conclusions for some have been impossible to determine due to the difficulty of attaining an accurate overview. This has been primarily due to poor and inconsistent data provision and, for many habitats, incomplete data sets. Future monitoring of habitats is also likely to be hindered by the closure of the national habitat monitoring scheme, BARS2, in November 2016 which provided a location to collate priority habitat data⁴.

These constraints are significant as regards reviewing the current habitat targets and few definitive conclusions can be made. Furthermore, quantifying habitat change as a direct result of planning policy and decisions is difficult as no consistent and formal reporting system exists. Only anecdotal evidence is available to this effect. The anecdotal data suggests that the primary mechanism for delivering new habitats is funding secured by land-managers from grant-giving bodies such as the Heritage Lottery Fund and the City Bridge Trust to create new habitats as part of capital schemes to improve or transform existing areas of green space. The land-use planning system (and the obligations relating to planning permissions) can deliver habitat creation, where habitat creation is part of a larger scale regeneration project. The most obvious example is river restoration schemes where deculverting, or naturalising of concrete channels, has been achieved in major redevelopment schemes where the river channel has become a focal point for regeneration.

Given the inconsistencies and patchiness of the data to assess progress on these habitat targets and the difficulty in determining the amount of habitat that has been created as a result of conditions or obligations related to land-use planning decisions we do not recommend that future targets should be included in the *London Plan*.

¹ <https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan/london-plan-chapter-seven-londons-living-spac-21>

² http://tna.europarchive.org/frame/20110303145238/http://www.ukbap.org.uk/library/brig/TargetsReview06/Final/CountryTarget_Tables_2006update.pdf

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf

⁴ <http://jncc.defra.gov.uk/page-7342>

Nevertheless, we believe there is value in setting habitat creation targets for Greater London, in line with Government policy in paras 109 and 114 of the National Planning Policy Framework⁵. These should reflect green infrastructure principles that marry nature conservation with other functional benefits of semi-natural habitats. This aligns with the aspirations of the Natural Environment White Paper, with the emphasis on establishing coherent ecological networks to enhance biodiversity and ecological resilience⁶.

Consequently we recommend that a suite of habitat creation targets are retained in future GLA policy and strategy. These are set out in the table below:

Habitat	By 2025 (ha)	By 2050 (ha)
Species-rich woodland	20	200
Flower-rich grassland	50	250
Rivers and streams	10 km	40 km
Reedbeds	5	30

The rationale for restricting targets to these habitats is as follows:

1. Species-rich woodland – Increase London’s existing tree canopy by 5% (the equivalent of 1% of London’s total tree canopy cover) by 2050, by creating 2000 hectares of woodland in London’s urban fringe. The habitat creation target proposes that a minimum of 10% of this planting in the urban fringe is species-rich woodland designed and planted to a higher standard than general woodland planting by being structurally diverse, comprised entirely of native species and incorporating a woodland ground flora.
2. Flower-rich grassland – there is approximately 28,000 hectares of public green space in London (i.e. parks). Much of this is managed as recreational and amenity space because of the benefits of encouraging physical exercise and associated health benefits of outdoor recreation and relaxation. However, there is an increasing awareness and demand for this space to make a larger contribution to London’s ecology, particularly with regards to providing habitat for pollinators such as butterflies and bees. A target of creating an additional 250 hectares of flower-rich grassland by 2050 would require just 1% of existing public green space to be improved to provide this additional habitat. Flower-rich grasslands are those which comprise a range of native wildflower species present in grassland sward that is not dominated by perennial ryegrass.
3. Rivers and streams – the EU Water Framework Directive requires all water bodies (including rivers and streams) to achieve good ecological status⁷. This, alongside more natural approaches to managing flooding, has resulted in initiatives and measures to restore rivers where possible including deculverting, removing concrete channels and creating in-channel features to improve structural diversity. In London this has been catalysed by the London Rivers Action Plan which has resulted in 17.5 km of river channel being restored since 2008⁸. The target is an extrapolation of the trend to 2050.

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf

⁷ http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm

⁸ <http://www.therrc.co.uk/lrap/lplan.pdf>

4. Reedbeds – the creation of reedbeds has been a feature of habitat creation effort in London since the London Lakes Rehabilitation Project – an EU Life funded project from 1993-1996⁹. The project piloted the creation of reedbeds in lakes in London parks to address a chronic problem of nutrient enrichment and pollution and to create supplementary wildlife habitat. The project subsequently led to the establishment of new reedbeds in the Royal Parks, Stoke Newington Reservoirs and Walthamstow Reservoirs and several other water bodies. The establishment of reedbeds also contributes to the objectives of the EU Water Framework Directive. The target encourages the continued installation of reedbeds to meet these objectives.

We recommend that the most pragmatic location for these targets is the Mayor's new London Environment Strategy. We also recommend that boroughs and other land-managers should report annually on progress towards meeting these targets. N.b. This is already the case for 'Rivers and Streams' where data is collected by the Environment Agency on behalf of the GLA.

However, a link should be made between the strategy and the *London Plan*, for example explicit reference to enhancing and extending existing habitats of conservation importance and the SINC network. There will be additional benefit in spatially representing these habitats of conservation importance and SINC as ecological networks (as set out National Planning Policy Framework) to guide future delivery of where these may best take place.

Enhancing ecological networks and wildlife corridors will requires expanding and augmenting priority and, where possible, making the existing network of Sites of Importance for Nature Conservation (SINCs) more resilient through buffering and strengthening connectivity. These habitats are listed below:

- *Acid grassland*
- *Chalk grassland*
- *Fen, marsh & swamp*
- *Lowland meadows*
- *Coastal & floodplain grazing marsh*
- *Open mosaic habitats on previously developed land*
- *Orchards*

Commitments to retaining the current extent and quality of these habitats, and gaining a more accurate assessment of their extent, should also be included in the Environment Strategy. We recommend that the Environment Strategy should include a map identifying areas where the creation of priority habitat should be focused (i.e. in proximity to those SINCs which support the core areas of priority habitats. However, given the impracticality of monitoring these habitats precisely due to the abandonment of national targets and the national monitoring system we recommend that no specific targets should be set.

We do suggest however that a new method for monitoring on-going habitat change in Greater London is considered by relevant partners in order to find a more effective means of useful data acquisition to accurately measure changes to habitat extent and quality. Consideration should be given to piloting remote sensing and monitoring methods (e.g. UAV (drone) imagery, etc.) some of which are already being trialled by some biodiversity conservation practitioners. Nevertheless, a portal of data collection will still be required. Whilst the recently terminated BARS2 system wasn't widely adopted by many habitat managers in London, we believe that a more bespoke system to capture data related to the targets in the table above should be investigated.

⁹ http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=642&docType=pdf

2. Introduction

The London Plan is the Mayor's statutory spatial development strategy for Greater London, published by the Greater London Authority (GLA). The current London Plan (consolidated with alterations since 2011, March 2015) is currently under review. A revised London Plan is due to be adopted after due process in 2019.

The new London Environment Strategy is currently under development, and could potentially be a suitable alternative location for new and/or amended habitat targets, if necessary.

London Wildlife Trust (LWT) and Greenspace information for Greater London (GiGL) were commissioned by the GLA to undertake a review of *The London Plan's* habitat targets set out in Table 7.3 (London Biodiversity Action Plan (BAP) habitat targets for 2020) embedded in Policy 7.19 '*Biodiversity and access to nature*' (Mayor of London, 2011).

The primary reasons to carry out the review were to:

- establish the progress towards meeting the current habitat targets since 2008;
- draw conclusions as to the effectiveness of *The London Plan* (Policy 7.19) in delivering active nature conservation;
- suggest potential new habitat/biodiversity targets that can be reliably monitored and provide effective indicators of real delivery and;
- produce a methodology paper, setting out in plain language, how the review of targets was undertaken; the rationale behind any new targets/habitats suggested; and, the data sources available that will enable the GLA to monitor future trends.

This report provides an overview of all obtainable habitat data gathered by LWT and GiGL from land managers' existing and previously acquired datasets. Based on interrogation of the data, conclusions are drawn as to whether habitat targets have been met, and as to how these have been driven – directly or otherwise – by development control decisions and planning policy.

New targets for a selection of priority habitats are set out in an updated draft table.

3. Habitat targets context

3.1 London Plan target origins

The current *London Plan* habitat targets listed in Table 7.3 were informed by the now largely moribund London Biodiversity Partnership in 2006-08. These targets were derived from the national priority habitats¹⁰ embedded in the UK Biodiversity Action Plan (1994, updated 2007) which occur in London, and formed the basis of the London BAP (2000, updated 2008).

Each priority habitat is given three target figures, the categories of which are:

- **Maintain** current net extent
- Target to **enhance** by 2020 (from 2008 baseline)
- Target to **increase** by 2020 (from 2008 baseline)

These target categories were derived from the UK targets and are reviewed in more detail in chapter 5. *Review of habitat targets*.

Some habitats for which Habitat Action Plans (HAPs) were drafted in the London BAP were omitted from the *London Plan* habitat targets table, namely;

- Parks & urban green spaces
- Private gardens

These habitats were omitted as they are not considered broad natural habitat types in their own right (at a national level) and typically include a range of other habitat types. Nevertheless, we recognise they represent a significant proportion of London's green infrastructure and omitting these habitats in the Environment Strategy (and *London Plan*) risks missing an opportunity to integrate biodiversity enhancement targets within the broader green infrastructure narrative.

3.2 Policy context

There has been a raft of nature conservation policy and strategy that has evolved over the past 20 years helping to integrate habitat conservation and creation targets within the future planning of town and country. The following are relevant examples.

Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network (Lawton et al., 2010)

Making Space for Nature (a.k.a. the Lawton Review) reviewed England's wildlife sites – especially designated sites - and their capability of adapting to the increasing pressure of climate change on habitats and the species that rely on them. Emphasis is given to outlining approaches to develop a more resilient ecological network and thus reduce the damaging impacts of fragmentation.

The report includes 24 wide-ranging recommendations. Five themes unite them; the following are relevant to the *London Plan* habitat targets:

(ii) We need to properly plan ecological networks, including restoration areas. Restoration needs to take place throughout England. However, in some areas, both the scale of what can be delivered to enhance the network, and the ensuing benefits for wildlife and people, will be very high. These large areas should be formally recognised as Ecological Restoration Zones (ERZs)¹¹.

¹⁰ As presented in the UK Biodiversity Action Plan. The priority habitats are provided here in the updated 2007 review of UK BAP priority habitats and species: http://jncc.defra.gov.uk/PDF/UKBAP_Species-HabitatsReview-2007.pdf

¹¹ ERZs became Nature Improvement Areas in the Natural Environment White Paper; two NIA projects were subsequently developed which include parts of London; Greater Thames Marshes, and Lower Lee Catchment.

(iii) There are a large number of surviving patches of important wildlife habitat scattered across England outside of SSSIs, for example in Local Wildlife Sites. We need to take steps to improve the protection and management of these remaining wildlife habitats. 'Protection' will usually be best achieved through incentive-based mechanisms, but at times may require designation.

The recommendation to plan ecological networks is echoed in the National Planning Policy Framework.

Biodiversity 2020 (Defra, 2011)

Biodiversity 2020 is the strategy outlining how national and international legislative and policy commitments for conserving biodiversity are being implemented for England. A series of outcomes are presented of which 'Outcome 1 – Habitats and ecosystems on land' provides a series of targets including the following which provides a national context to the London Plan habitat targets:

'1B. More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000 ha.'

The Natural Choice: Securing the Value of Nature (Defra, 2011)

The Natural Choice (a.k.a. the Natural Environment White Paper) provides a strategic suite of recommendations at a UK level to promoting the importance of nature with a focus on 'protecting and improving our natural environment', 'growing a green economy' and 'reconnecting people and nature'. The following relates to the London Plan policy 7.19:

'2.33 The Government expects the planning system to deliver the homes, business, infrastructure and thriving local places that the country needs, while protecting and enhancing the natural and historic environment. Planning has a key role in securing a sustainable future.'

The National Planning Policy Framework (DCLG, 2012)

The National Planning Policy Framework (NPPF) sets out planning policy for England and the ways in which they are to be applied. Paragraph 109 is relevant to the London Plan habitat targets:

'The planning system should contribute to and enhance the natural and local environment by:

- protecting and enhancing valued landscapes, geological conservation interests and soils;*
- recognising the wider benefits of ecosystem services;*
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and*
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.'*

Paragraph 114 also sets out;

'Local planning authorities should:

- set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure;*

Therefore the Mayor's Environment Strategy could include maps of ecological networks based on the known extent of habitats of conservation importance and the SINC network.

Improving Natural Capital: An Assessment of Progress (Natural Capital Committee, 2017)

The Natural Capital Committee (NCC) was established by government in 2011 in order to provide advice to government on the sustainable use of elements of the natural environment which provide important goods and services (natural capital) in England. The committee was re-established in January 2016 and will continue to fulfil its purpose until 2020, with the primary goal of assisting government in carrying out its 25-year Environmental Plan.

Recommendation 16:

- *'The 25 Year Environment Plan should consider the creation and enhancement of new wildlife areas and corridors, including in collaboration with National Parks, landowners, local authorities, developers and infrastructure providers. This should include a commitment by the government to enhance England's wildlife in line with the recommendations of the Lawton Report (2010).'*

This relates to the thrust of the *London Plan* habitat targets, as these should inform the extent and character of 'new wildlife areas and corridors'.

Connecting with London Nature: the Mayor's Biodiversity Strategy (Greater London Authority, 2002)

The Strategy, already to some extent out of date, provides a basis for commitments to habitat targets through a number of proposals, including:

Proposal 6: The Mayor will and boroughs should ensure that new development capitalises on opportunities to create, manage and enhance wildlife habitat and natural landscape. Priority should be given to sites within or near to areas deficient in accessible wildlife habitats, areas of regeneration, and adjacent to existing wildlife sites.

Green Infrastructure and Open Environments: the All London Green Grid, Supplementary Planning Guidance (Greater London Authority, 2012)

The Mayor's 'green infrastructure strategy' includes commitments to conserve and enhance biodiversity and increase access to nature, including:

4.19 The network of wildlife sites is key to the conservation of London's biodiversity, and a critical component of the London and local Biodiversity Action Plans. Nevertheless, biodiversity exists outside this network, and there will be opportunities through the ALGG to enhance, expand and connect this network. London Plan Policy 7.19 (Biodiversity and access to nature) provides the strategic policy on this issue.

As well as addressing areas of deficiency, boroughs should also demonstrate how they will contribute to achieving the Biodiversity Action Plan targets identified in the London Plan and should identify, protect and enhance corridors for movement of species. These green corridors and 'stepping stones' can fit perfectly within a network of green infrastructure.

Natural Capital: Investing in a Green Infrastructure for a Future London (Greater London Authority, 2015)

The report of the Mayor's Green Infrastructure Task Force set out a suite of recommendations to address the challenges of creating and sustaining a high quality multi-functional green

infrastructure for London in the face of significant anticipated – but disparate - population and economic growth, and climate change. It recognises the role of planning – and the *London Plan* – in helping to achieve this (e.g. Recommendations 1, 3, 4 and 4), and sets out objectives for conserving and extending habitats. For example

One of the five objectives:

4. Creating Living Landscapes – enhancing natural processes for the benefit of people and wildlife and conserving the most special landscapes, habitats and species.

Proposed Green Infrastructure Ambitions by 2050 (two of six):

- *London should maintain its status as one of the world's greenest capital cities – 50% of the administrative area should be green infrastructure;*¹²
- *At least 20% of London's area will be designated of high wildlife value.*¹³

The overall direction of planning policy and other guidance provides a rationale for the continued protection and creation of key habitats through the planning system and other spatial strategies. However, this is now primarily based on enhancing resilience of existing ecological networks (with an implicit, we believe, recognition of the need to address the conservation of habitats of conservation importance and species of conservation concern therein). These should help to guide conservation activity, including that driven by the planning process, towards achieving national and regional biodiversity conservation objectives.

There are no requirements in national policy for the *London Plan* to specifically list quantifiable habitat targets. Whilst it is critical to maintain commitments within the *Plan* to protecting and enhancing habitats of conservation importance, the emphasis should be on protecting and establishing coherent ecological networks to enhance biodiversity and ecological resilience. New development would be expected to contribute to enhancing these networks, for example in enhancement zones around existing SINC.

¹² Effectively an increase of 9,000 hectares from 2015

¹³ As of 2016 about 19% of Greater London is designated as a Site of Importance for Nature Conservation

4. Review methodology

4.1 Overview of data sources

Data were gathered from four different sources in order to provide an ‘as accurate as possible’ overview of the current extent of priority habitats and works undertaken on them. These sources were as follows:

- **Land managers** – all borough councils, relevant voluntary sector organisations and agencies were contacted and requested to complete a data collection spreadsheet. On-going discussions with some land managers required individual meetings to be organised where necessary;
- **BARS2** – an extract of data for Greater London from this online platform was requested from JNCC and the project team requested a summary data extract of actions by organisations acting within Greater London;
- **London Wildlife Habitat Survey data** – includes borough survey data from 1984-2009 held and managed by GiGL;
- **Borough or site re-survey data** – some councils have commissioned re-surveys, often focused on reviews of Sites of Importance for Nature Conservation (SINCs), and provided mapped data to GiGL.

See Appendix 4 for a more detailed overview of the above sources of data.

4.1.1 Data source strengths and weaknesses

Table 1. Data source strengths and weaknesses

Data source	Strengths	Weaknesses
Land manager data	<ul style="list-style-type: none"> • Data may capture smaller projects/works not recorded elsewhere • Consultation project specific so information relates directly to the BAP habitats of interest • Enables very recent changes to be accounted for 	<ul style="list-style-type: none"> • Data inconsistent or vague, arriving in a range of formats and spatial resolutions • Time and resource constraints preclude data being passed on • Non-spatial, therefore chance of duplication if different site names used
BARS2	<ul style="list-style-type: none"> • Detailed and high quality • Simply and easily extracted from the online portal (prior to closure) • Spatial data (though to different resolutions) • Represents BAP habitats (though see cons) 	<ul style="list-style-type: none"> • Data typically only input as a required aspect of project funding • Data entry known to be poor (hence closure) and therefore incomplete • Now closed – will not be available as a source of data in future • UK BAP habitats rather than London priority habitats, so some differences in definition likely
Comprehensive borough habitat survey data	<ul style="list-style-type: none"> • Detailed and high quality • Spatial data • Previous London estimates 	<ul style="list-style-type: none"> • Completed over a long period meaning data is not temporally consistent

(collected 1988-2009)	and BAP condition assessment work performed on similar/same data	<ul style="list-style-type: none"> • BAP habitats not specifically surveyed for so translation required
Borough or site re-survey data	<ul style="list-style-type: none"> • Detailed and high quality • Spatial data • Updates the comprehensive borough data, where relevant, usually at 10 year intervals 	<ul style="list-style-type: none"> • Partial coverage – only certain boroughs and frequently only SINC sites within a borough • Potential loss of older data from overlapping parcels due to spatial conflicts on update

4.2 Collating available datasets to estimate the current habitat extents

1. The baseline from comprehensive borough surveys in the London Phase 1 method (1984-2009) were translated into the London BAP habitats listed in the London Plan, based on methods defined by the LBP-GiGL habitat condition assessment project (see Appendix 2).
2. More recent spatial data previously shared with GiGL were assessed to identify those that could update baseline parcels. Those suitable, from borough or SINC surveys (2011-15), were translated into the London BAP habitats listed in the London Plan. This was based on methods defined by the LBP-GiGL habitat condition assessment project for those carried out in London Phase 1 method and with a category assessment for the survey carried out in the JNCC Phase 1 method.
3. A spatial analysis was carried out to identify which data in the 1984-2009 baseline to replace with newer resurvey data. Data from parcels of land from the baseline coverage were only retained if they were 0-5% overlapped by resurvey parcels, new data replaced the remaining. The combined total areas per habitat per borough were summed and presented with their survey date for reference.
4. BARS2 data (stored as points or polygons) were processed to combine duplicate reports, filter out incomplete actions and separate measurement type and activity types. Reports that involved the increase of a habitat that corresponded to a London BAP habitat and had measurement in an area unit were summed per habitat category per borough. Dates were cross-referenced. All BARS data was more recent than the 1984-2009 baseline survey data. If dates had overlap with newer resurvey data, the BARS reports for that borough were spatially assessed and only retained for the calculation if they related to parcels that had not been included in the resurvey (as most were partial borough coverage). Final area sums were added to the baseline/resurvey totals as representing increases in those habitats.
5. Land managers' data were entered into a template. Responses were combined into a single table and data that were also reported on BARS, didn't have permission to use, or were missing measurement or habitat information were removed. Area units were standardised to hectares and dates to a single year. Responses regarding creation of habitat were separated. Areas created per habitat per borough were summed and added to the combined totals. Exceptions were the few where the date of the habitat creation overlapped with the date of other sources, in these cases the most recent source only was used. The same process was carried out for (the few) responses detailing habitat loss and these areas were subtracted from the relevant habitat per borough.
6. A few additional sources of information were separately included, for example London Wildlife Trust's own habitat creation totals and Croydon Council's Habitat Action Plan total

areas for heathland and chalk grassland, which post-dated the available baseline survey data.

7. Finally, the data for each borough was combined by habitat category to arrive at a total area per habitat for London.

A full list of organisations contacted and the representatives that attended the workshop is provided in Appendix 1.

5. Review of habitat targets

5.1 Data assessment

5.1.1 Data gaps

Throughout the process of gathering and collating habitat data, significant gaps in data coverage became apparent. Whilst a fully comprehensive and up-to-date data set for London was unlikely to be provided within the timeframe and available resource there were several constraints which significantly impacted on the collection and analysis of data acquired (see Appendix 5).

5.1.2 Duplication of data

Duplication of data was flagged as a potential issue in the early stages of the review where, for example, multiple bodies may report on a single project with which they were all involved. This is particularly the case for data extracted from BARS2 which has in some instances been reported more than once via data provided by land managers. Every effort has been made to 'clean' data in order to remove potential duplication from the final analysis. For example, reedbeds installed by London Wildlife Trust at Woodberry Wetlands were also reported by Thames Water Ltd., the site owners.

When habitat creation or enhancement works are carried out, projects don't always include a data capture component. Furthermore, although most London boroughs and several major land owners' are GiGL partners, the exchange of habitat data since the end of the comprehensive borough survey programme in 2008-09 has been less embedded within work plans than the sharing of species records or open spaces information.

5.2 Habitat definitions

The priority habitats included in the *London Plan* are derived from the London BAP (2000) which were themselves translated from the UK BAP (1994) but in some cases are slightly modified.

Some translation of habitat types has taken place where narrower habitat types are used in ecological surveys which follow the standard Phase 1 habitat survey methodology (JNCC, 1990), as modified for Greater London by the former London Ecology Unit (LEU, 1994) and subsequently adopted by the Greater London Authority.

For example, the London BAP habitat '*Woodland*' (for which there is an existing target) is known broadly as '*Broadleaved, Mixed and Yew Woodland*' in the UK BAP habitat types but may also be reported on BARS2 as: '*Lowland Mixed Deciduous Woodland*'. The 2016 baseline figure calculated includes '*Native broadleaved woodland*', '*Non-native broadleaved woodland*' and '*Coniferous woodland*'.

For some habitats, however, there is a simple one-to-one translation between London BAP, London Phase 1 and BARS2 habitat types, such as '*Acid grassland*'. Methods for translating London BAP habitats from the London Phase 1 categories followed those devised by the LBP-GiGL BAP habitat condition assessment and suitability project as these were developed in collaboration with Habitat Action Plan groups (see Appendix 2).

Habitat categories available in BARS follow the UK BAP names. It was therefore required to identify which habitat names within the usable data extracts represented London BAP habitats of interest. This was discussed at the workshop and the habitats used were as below.

Table 2. Habitat type translations

London BAP habitat	BARS 2 Priority habitat within data extract
Acid grassland	Acid Grassland
Woodland	Broadleaved, Mixed and Yew Woodland
	Lowland Mixed Deciduous Woodland
Standing water	Ponds
	Standing Open Water and Canals
	Eutrophic Standing Waters
Rivers and streams	Rivers
	Rivers and Streams
Reedbed	Reedbeds
Orchard	Traditional Orchards
Meadows and pastures	Lowland Meadows
Heathland	Lowland Heathland
Fen, marsh and swamp	Fen, Marsh and Swamp
	Wet Woodland
Coastal and floodplain grazing marsh	Coastal and Floodplain Grazing Marsh
Open mosaic habitats on previously developed land	Open Mosaic Habitats on Previously Developed Land

5.3 Category definitions (maintain, enhance and create)

Adequately and consistently defining interventions has proven to be difficult and more challenging to report. Defining the difference between habitat maintenance, enhancement and creation highlights different interpretations of often complex scenarios. This creates difficulties in analysis and ultimately defaults to subjective assessments.

Some data appeared to be very inconsistent due to individual interpretations of the term ‘enhancement’. For the purposes of this report, ‘enhancement’ is not defined for each habitat primarily because we recommend that enhancement targets be removed from the newly proposed habitat targets table (see chapter 7.2 New targets).

The process of maintaining a habitat can be problematic to separate from enhancement. Broadly however, ‘maintain’ can be defined as the process of preserving the condition of a habitat through on-going and favourable management. This means no net loss of condition or extent but equally no improvement or extension either. For example, in the case of a wildflower meadow, this may involve an annual cut and/or summer grazing to sustain its existing assemblage of wildflower species.

‘Creation’ is perhaps more easily defined as the creation of new habitat in spaces where that habitat currently does not exist. We suggest that creation can be applied to areas which may have supported a specific habitat previously but which has since been lost and changed into different habitat. Returning these areas to a previous habitat may, however, be more accurately defined as ‘restoration’; we recommend that this should be included in the ‘creation’ targets. For example, the removal of secondary woodland and scrub to return an area to open chalk grassland would be classed as habitat creation. Similarly, if an intensively managed arable field (for example) was planted with native trees to develop into a deciduous woodland, this would also be defined as habitat creation.

5.4 Comparison of baseline habitat area figures

Table 3 presents a comparison between the estimated baseline areas of each habitat from the London Biodiversity Partnership's 2000 audit, the 'maintain current net extent' figures in the *London Plan*, and the newly calculated figures.

The habitat figures provided in the LBP 2000 audit are included within the comparison in order to introduce an extra point of reference. This is because the newly calculated figures for some habitats such as *Woodland* and *Standing Water* were so different to those provided in the *London Plan*, an extra data set (underpinned by a similar methodology) was required to cross-reference. Indeed, the aforementioned habitats match far more closely with LBP 2000 audit figures, suggesting significant discrepancies in some of the *London Plan* figures (see Table 3). A three way comparison allows for more meaningful comparisons between the *London Plan* figures and the newly calculated figures to be made despite potential discrepancies in all of the three datasets.

An evaluation of the figures provided in Table 3 is provided below.

Table 3. Baseline priority habitat area figures

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Acid grassland	1,264	1,466	1,522.6
Chalk grassland	319	350	336.4
Fen, marsh & swamp	272.5	109	123.5
Coastal and floodplain grazing marsh	848	850	288.3
Heathland	79.85	45	55.5
Meadows and pastures	11,000	685	707.7
Open mosaic habitats on previously developed land	-	185	947
Orchards	-	18	49.6
Reedbeds	43.5	131	144.3
Rivers and streams	-	614 km	-
Standing water	2,014	599	1,707.7
Tidal Thames	-	2,300	
Woodland	7,104	4,909	7,477

5.5 Evaluation of baseline figures

5.5.1 Acid grassland

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Acid grassland	1264	1,466	1,522.6

The figures for acid grassland differ by a significant margin. The difference in coverage between the *London Plan* and 2016 figures indicates an increase in area of just under 57 hectares (ha). This seems unlikely. However, the habitat definition has little ambiguity and translates well from the UK BAP into a London context. It is difficult to determine whether the *London Plan* figure is an underestimate or whether the 2016 figure is an overestimate.

5.5.2 Chalk grassland

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Chalk grassland	319	350	336.4

The figures suggest a decrease in area. However, the *London Plan* figure seems to have been rounded up, perhaps higher than was necessary. Nonetheless, it is possible that some chalk grassland sites may have been lost to scrub through lack of management.

5.5.3 Fen, marsh & swamp

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Fen, marsh & swamp	272.5	109	123.5

The original 2000 audit figure is far higher than either the *London Plan* figure or the 2016 figure. This is as a result of differing definitions. The 2000 audit figure refers to a wide habitat type called 'Marshland' which includes: 'Bog', 'Wet marginal vegetation', 'Fen', 'Wet marshy grassland' and 'Ditches'. The 2016 figure refers more strictly to 'Typha', 'Fen carr' and 'Bog' based on the London Survey Method habitat categories. The similarity of the 2016 and London Plan figures suggest the *London Plan* figure was calculated using the latter habitat definition. If that is the case, then there has been an increase in habitat extent of just under 15 ha. Despite evidently being positive progress, there is no increase target for *Fen, marsh & swamp*.

5.5.4 Coastal and floodplain grazing marsh

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Coastal and floodplain grazing marsh	848	850	288.3

The 2000 BAP audit and *London Plan* figures match closely and it seems likely that the latter (850 ha) was rounded up from the former (848 ha). The 2016 figure was calculated based on the definition provided in the London Survey Method which defines the habitat as ‘*Flood plain grazing marsh*’ which can be one or a mixture of neutral grassland types (including biologically poor amenity grassland) with the qualifiers of ‘*Wet grassland*’ or ‘*Grassland with flush*’ and presence of ‘*Drainage ditches*’.

Despite this definition being followed when interrogating existing data sets, the definition to achieve the London Plan figure was clearly far broader. For example, areas known by the Trust’s ecologists to represent coastal grazing marsh, such as Erith Marshes, are recorded in GiGL-held datasets as a mosaic of habitats such as saltmarsh, amenity grassland, ruderal vegetation, bare ground, reedbeds, etc. It is difficult to determine how this figure was calculated.

For these reasons, no conclusions can be drawn as to whether the target to increase by 50 ha has been met.

5.5.5 Heathland

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Heathland	79.85	45	55.5

Based on the 2016 figure, the *London Plan* figure appears to be an under-estimate as the HLF-funded London’s Heathland Heritage (LHH, 2004-06) states that there was 78 ha of heathland in London in 2006 (LHH, 2006). Furthermore, it seems very unlikely that 35 ha of heathland was lost between 2000-08. If the *London Plan* figure is taken to be reliable then there has been an increase of 9.8 ha. If we are to take the LHH figure as the most reliable baseline at the time, then this would result in a decrease of 23.2 ha. It is difficult to determine which dataset is more reliable and so deciding on whether there has been net loss or net increase in extent is hard to confirm.

5.5.6 Meadows and pastures

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Meadows and pastures	11,000	685	707.7

The 2000 audit figure refers to the broad habitat type which includes all ‘unimproved and semi-improved neutral grassland’. Clearly this results in a significant 11,000 ha. The 2016 figure is more strictly defined as ‘*Neutral grassland (herb-rich)*’ based on the LBP-GiGL BAP habitat condition assessment definition and the BARS reporting category *Lowland Meadows*, which appears to more closely match the figure in the *London Plan* and thus it seems likely that the habitat definitions are similar, if not the same. This is likely what is referred to as the ‘better’ habitat in the LBP 2006 report of the broader habitat type upon which habitat enhancement or creation should be given greater priority.

There has been an increase of 22.7 ha which is deemed likely based on the popularity for meadow creation in recent years.

5.5.7 Open mosaic habitats on previously developed land

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Open mosaic habitats on previously developed land	-	185	947

Difficulties with defining this habitat have severely hindered the ability to make any meaningful comparisons between figures. No total area figure is given in the 2000 audit but the huge difference between the *London Plan* figure (185 ha) and the 2016 figure (947 ha) must arise from a difference in definition. For the 2016 figure, BARS data (a small quantity) followed the exact definition. Figures translated from London Phase 1 survey data (a majority) were based on the method used by the LBP-GiGL BAP habitat condition assessment project, which was an interpretation of the Buglife *All of a Buzz* project site assessment form (see Appendix 2).

In this review 'Wasteland/Brownfield' parcels were identified if they included a particular London Survey Method category and one of two other London Survey Method categories: 'Roughland' OR 'Bare soil and rock' AND 'Ruderal or ephemeral'. There are limitations to this method to define open mosaic as the habitats may be present in mosaic assemblage, or separately. No consideration of the development status of the site was included. Therefore it is likely an overestimate of the extent of open mosaic habitat and particularly that on previously developed land. As a result, we cannot make any clear judgements on whether this habitat has increased or decreased.

5.5.8 Orchards

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Orchards	-	18	49.6

Orchards were not surveyed for the 2000 BAP audit and so only direct comparison between the *London Plan* and the 2016 figures can be made. There appears to have been a large increase of just over 30 ha. Despite no figures being provided by the Urban Orchard Project, GiGL were able to calculate net London extent extracted from the borough-wide survey and more recent survey data. This increase seems feasible based on the recent drive for orchard planting.

5.5.9 Reedbeds

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Reedbeds	43.5	131	144.3

The 2000 BAP audit figure is either a significant underestimate or there was a significant increase in area between 1999 and 2008 (87 ha). It is well known that reedbed area has been increasing in London due to some major projects, so the increase of 13.3 ha between the *London Plan* and 2016 figures is perhaps slightly lower than expected. It seems probable that all figures are relatively accurate due to the ease with which the habitat is defined and the appetite for its creation.

5.5.10 Rivers and streams

Priority habitat	LBP 2000 audit baseline (km)	Baseline area in London Plan (km)	Renewed 2016 baseline area (km)
Rivers and streams	-	614	-

Although de-culverting and the creation of new channels could be classed as processes which increase the physical extent of the river channel, they are interventions that are reported as restoration by the Environment Agency (the primary provider of data for this habitat) alongside a range of other interventions (see Chapter 7.2: New Targets). Indeed, **the target for increase in the London Plan refers to restoration.**

Restoration figures provided by the Environment Agency indicate a total restoration figure of 17.7 km (by 2015) which appears to be on track for the 25 km target by 2020. Restoration and enhancement works to rivers and streams are known to be one of the few examples of habitat targets which have been – at least in part - delivered directly via the land-use planning process.

5.5.11 Standing water

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Standing water	2,014	599	1,707.7

The reasoning behind the very low *London Plan* figure is unknown. All figures rely on the same definitions and all include canals. If we compare the 2000 audit figure and the 2016 figure, it would appear there has been a decrease of around approximately 300 ha which is very unlikely. The reasons for the discrepancies between each figure is unknown.

5.5.12 Tidal Thames

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Tidal Thames	-	2,300	2,098

By direct comparison of the *London Plan* and 2016 figures, there appears to have been a decrease in extent of 202 ha. It is unlikely that this extent of habitat has been lost to development and is more likely an artefact of the renewed habitat definition (proposed in Chapter 7.3: Habitats with Low Data Confidence). The 2016 figure instead refers to all habitat area below the high water mark.

5.5.13 Woodland

Priority habitat	LBP 2000 audit baseline (ha)	Baseline area in London Plan (ha)	Renewed 2016 baseline area (ha)
Woodland	7,104	4,909	7,477

Definitions for this habitat closely match between the 2000 BAP audit and calculations for the 2016 figure ('*Native broadleaved woodland*' and '*Non-native broadleaved woodland*') and therefore we can assume they are comparable (the only difference being that the 2000 audit does not include '*Coniferous woodland*' – a very small habitat area in London regardless). However, the reasoning for the low *London Plan* figure is unknown and it seems the habitat definition to reach this figure must have been far stricter. Even when narrowing the habitat type down to simply '*Native broadleaved woodland*', the 2000 audit figure is still far higher at 5,896 ha so it not clear as to how the *London Plan* figure was identified.

5.6 Evaluation of enhancement figures

Table 4. Enhancement figure comparison

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Acid grassland	40	22
Chalk grassland	30	25
Fen, marsh and swamp	10	3
Coastal floodplain grazing marsh	200	63
Heathland	20	2
Meadows and pastures	40	199
Orchards	13	2
Reedbeds	20	0.1
Rivers and streams	100 (km)	235 (km)
Standing water	7 >2ha sites 20 <2ha sites	488
Tidal Thames	2 km	-
Woodland	500	420

There has been progress on meeting the habitat enhancements for the majority of habitats, although most are unlikely to be met by 2020 based on the current extents. Only *Meadows & pastures* and *Rivers and streams* appear – from the data – to have met their enhancement targets.

A principal caveat for all the enhancement figures is a level of subjectivity in defining 'enhancement' which is likely to vary widely between those who have provided data. Attempts have been made to assist data providers into differentiating between 'enhancement' and 'creation' and/or 'maintenance', although ultimately it is based on the respondents' judgements alone.

5.6.1 Acid grassland

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Acid grassland	40	22

Target not met. This figure may be higher with the inclusion data from The Royal Parks (who manage significant areas of this habitat in London) though this data has yet to be provided.

5.6.2 Chalk grassland

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Chalk grassland	30	25

This target is very close to being met, with only a further 5 ha of enhancement works required. Based on current trends it is feasible for the 2020 target to be achieved.

5.6.3 Fen, marsh & swamp

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Fen, marsh & swamp	10	3

Target not yet met. Confusion with defining the habitat may mask adequate reporting on enhancement works undertaken.

5.6.4 Floodplain grazing marsh

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Coastal and floodplain grazing marsh	200	63

Target not yet met. It seems unlikely that the 2020 target will be met over the next three years. The difficulty of differentiating between enhancement and maintenance likely precludes drawing strong conclusions on enhancement works undertaken on this habitat. Further work on this habitat has also revealed inconsistencies in its definition and so the above figure is unlikely to be an accurate representation.

5.6.5 Heathland

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Heathland	20	2

The target is not close to being met with an 18 ha deficit. The completion of London's Heathland Heritage by 2006 had resulted in significant enhancements to many heathland sites over the previous three years (although they may have taken longer to effectively materialise). The inability to further this subsequently with a specifically targeted fund may partially explain the very low enhancement figure.

5.6.6 Meadows and pastures

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Meadows and pastures	40	199

This is only one of two enhancement targets (the other being Rivers and streams) which has been met prior to the target date. However, the significantly high figure calculated may indicate confusion between maintenance, creation and enhancement practices. Metadata provided by some respondents suggests this may indeed be the case where, for example, an "area scraped and seeded with wildflower mix" is defined as enhancement but would more appropriately be described as creation. These differing categorisations are of course only possible to notice where extra information is provided. However, the majority of respondents did not provide further information from which further interrogation could be made.

5.6.7 Orchards

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Orchards	13	2

Target not yet met. It seems unlikely that this target will be met by 2020. Focus is often afforded to the planting of new orchards rather the enhancement of existing ones which are relatively scarce in Greater London. However, if information from the Urban Orchard Project emerged, then this could shed further light on progress.

5.6.8 Reedbeds

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Reedbeds	20	0.1

Target not close to being met. Again, for the same reasoning as the above, focus is primarily based on creation rather than enhancement. Furthermore, it is unclear what reedbed enhancements could be, other than expansion.

5.6.9 Rivers and streams

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
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Rivers and streams	100	235
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This target has been comfortably met. The likely reasoning for this is the strong regional and national emphasis on river enhancement work driven by a range of catchment partnerships and the Environment Agency. River and stream enhancements are well defined unlike most other priority habitats so this figure is likely to be robust.

5.6.10 Standing water

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Standing water	7 >2ha sites 20 <2ha sites	488

This target is difficult to evaluate as the current target appears to be referring to ponds and respondents have not reported at this level of detail, plus some organisations with a specific relevant focus (e.g. Froglife) have yet to provide data. Regardless, enhancement for standing water appears to be difficult to measure and define. For example, small enhancements to water quality in one area of a reservoir could then be claimed to have improved the entire extent. This may mask the reality of standing water enhancements.

5.6.11 Tidal Thames

Priority habitat	London Plan enhancement target (km)	Enhancement figures since 2008 (km)
Tidal Thames	2km	0

No enhancement figures for the *Tidal Thames* were obtained from land managers and so this remains unknown.

5.6.12 Woodland

Priority habitat	London Plan enhancement target (ha)	Enhancement figures since 2008 (ha)
Woodland	500	420

It seems feasible that this enhancement target may be met by 2020. Woodland enhancement works are generally well-defined and understood by most land managers so the calculated figure is likely to be relatively robust.

6. Assessment of change

6.1 Rigour of data

As with the previous target setting, the data informing the extent of London's priority habitats is patchy and typically subject to the availability of recent survey data.

Some borough councils and other landowners have used the BARS reporting system to log activity on BAP habitat sites. However, not all increase or enhancement works are logged here meaning an incomplete dataset.




Data received from partners is variable in quality and we can assume that descriptions of habitat works undertaken will be naturally imprecise and thus add some level of uncertainty to our understanding of net gains or losses in habitat extent.

6.2 Analysis of habitat target progress

6.2.1 Increase target analysis

Table 5 indicates whether habitat 'increase' targets have been met so far – in that 2016 represents two-thirds of the target period. The confidence level in the final increase figures are colour coded based on the similarity of the habitat definitions, the reliability of the data source(s) for the newly calculated baseline figure, the perceived reliability of the *London Plan* baseline figures, and the ease with which the habitat is identified (thus reducing ambiguity).

Table 5. Target status' and data baseline confidence

High confidence	
Medium confidence	
Low confidence	

Priority habitat	Target to increase by 2020 from 2008 baseline(ha unless stated)	Calculated increase or decrease in habitat extent (ha)	Status
Acid grassland	10	+56.6**	Target met
Chalk grassland	10	-13.6	Target not met
Coastal and floodplain grazing marsh	50	-562	Target not met
Heathland	5	+10.5	Target met
Meadows and pastures	20	+22.7	Target met
Orchards	5	+31.5	Target met
Reedbeds	16	+13.3	Target not met
Rivers and streams	25km ('restore' target)	+17.7km	Target not met
Standing water	250 ponds <2ha	+1108.7**	Unknown
Woodland	20	+2674.3**	Target met

**Fen, marsh & swamp, Open mosaic habitats on previously developed land and Tidal Thames* are excluded as there is no increase target for these habitats in the London Plan.

**Anomalous figures are discussed below.

The preliminary results suggest general increases in habitat extent for most habitats. The targets of course are set for 2020 so even for those habitats which have not met their increase target, this could easily be met in the next 3 years. This is particularly the case for the rivers and streams restoration target which currently stands at 17.7km with a target of 25km.

6.2.2 Anomalies

Acid grassland

An increase in habitat extent of this scale is unlikely. The *London Plan* figure is either an underestimate or the 2016 figure is an overestimate; it is difficult to confirm which figure is the most accurate. Although it is likely that acid grassland has some increase in extent, we cannot draw any clear conclusions from comparison of the figures provided.

Woodland

The significantly large increase in woodland extent must be due to an under-estimate of the baseline area in the *London Plan* and so no conclusion can be drawn as to whether the habitat has been increased in area. Anecdotal evidence, through consultation with relevant partners, would suggest that woodland extent has increased but by a much smaller margin.

Standing water

No accurate conclusions can be drawn from the apparently significant increase in standing water extent. The target is based on the creation of 250 ponds <2ha but this is a difficult target to measure as any extension of standing water outside of this narrow definition must therefore be discounted. Furthermore, we have found that data received and that extracted from existing data sets is only rarely detailed enough to mention whether the increase is in the form of small ponds. For these reasons we are unable to confirm whether or not this target has been met.

6.3 Planning as a driver

A key reason for the inclusion of the habitat targets in the *London Plan* was a recognition that forward planning and development control had implications for biodiversity and habitat protection and creation/enhancement. They were derived from the London Biodiversity Action Plan, and later the Mayor's Biodiversity Strategy, which had attempted to identify quantitative targets to reflect the conservation ambitions for key habitats.

The planning system in London has a disproportionate impact on wildlife habitats compared to much of the rest of the country; this reflects the land use within London. However, whilst urban development has long eroded a significant part of London's underlying ecological fabric, this has been significantly reduced in recent decades. The planning system has had a key role in reducing the environmental impacts of new development, and this has been more specific towards protecting nature conservation interests since the mid-1980s. Indeed, the evolution and application of site protection policies and appropriate conditions for mitigation (including S106 agreements) means measures can be implemented to assist in the enhancement and/or creation of new habitat. Development proposals can include specific habitat enhancement measures and/or provide the mechanisms to enable the restoration and/or creation of BAP priority habitats.

An example is Braeburn Park, a mixture of woodland, open mosaic habitat and a geological SSSI (of about 20ha in total) in Crayford that is now under positive management through a S106 endowment following the development of a new residential estate. The development also led to the creation of just under 2 hectares of a bank of wildflower meadows and woodland planting to effectively help screen the development to the south and provide the context for a playspace for

the new estate. However, it is often difficult to draw up clear conclusions of habitat gain. For example, the development of Cat Hill campus in Cockfosters has resulted in S106 contributions to help enhance neighbouring woodland, but as a consequence of losing on-site bat foraging habitat (which in itself is not a priority habitat).



Braeburn Park

It appears from the data received that most documented progress towards targets over this period has not been driven by planning decisions. Whilst specific interventions have been made, for example the creation of living roofs, the majority of habitat enhancements and creation have been secured through targeted land management. There has been a widely tapped suite of specific resources and funding mechanisms in place (e.g. lottery, agri-environment schemes, landfill tax credits) to help deliver habitat restoration and creation in London over the past 15 years. Whilst these have declined in recent years, there are still funding commitments with targeted conservation measures in place (e.g. HLF's funding commitments to Brompton Cemetery, Beckenham Place Park, Walthamstow Wetlands, Hainault Forest, and Colne Valley). In addition, the resources that land managers can themselves devote to biodiversity conservation are still largely in place, although cuts in public funding are beginning to show their impact with the cessation of some programmes of activity (e.g. in various London boroughs).

The creation of Woodberry Wetlands by enhancing open water and creation of reedbeds, was not dependent on planning permissions for the project. However, the *London Plan* targets have been useful in providing policy levers for a development that would be consistent with the ambitions of Policy 7.19. For example London Wildlife Trust refers to these in applications to landfill and lottery funding, which require specific evidence of need.

In this respect, the London Plan habitat targets have had a role in providing an important policy lever, not only in respect of development proposals, but also responses to planning applications, the development of local plan and neighbourhood plan policies, and for grant funding proposals. Respondents to the data requests have indicated the embedding of BAP targets in the London Plan – as a statutory document - gives them stronger legitimacy for proposals that aim to restore, enhance and/or create habitats.

7. Setting future targets

7.1 Context of original target setting

The habitat targets currently presented in table 7.3 of *London Plan* policy 7.19 *Biodiversity and access to nature* were developed by the London Biodiversity Partnership and laid out in ‘*Strategic Targets for Priority Habitats in London*’, which was completed in 2006. This document provides some understanding of the processes that gave rise to the current *London Plan* targets.¹⁴ This has been useful in clarifying how previous figures relate to the newly calculated 2016 figures.

Targets were set based on the similarity of the national habitat priorities to the London priorities. For instance, it states that:

‘If the England target is for England to increase the resource by 10%, so should we seek to increase the London resource by 10%. Where the relationship is not one-to-one, or the size of the resource is poorly known, we estimate the appropriate increase with the best information available. The national extent is obtained from the proposed “maintain” target on the UK BAP website and the London extent is from the London Biodiversity Action Plan audit, unless indicated otherwise. London is 1.2% of England, but the individual habitat types can be under or over-represented in London in comparison with this figure.’ (LBP, 2006).

The priority habitats outlined are derived from the London BAP and these are described in terms of their relationship to the UK BAP broad habitat and priority habitat types.

There are no enhancement targets provided in this report; instead recommendations for ‘maintain’ and ‘increase’ targets are provided and it is stated that:

‘Improvements to habitat quality, rather than increases in areal extent, are the main thrust of the London Biodiversity Action Plan. These should be secured through development planning wherever possible. However, we do not recommend specific targets to improve habitat quality in this context, as quality is difficult to measure objectively and even more difficult to assure at the time that a development proposal is considered.’ (LBP, 2006).

It is therefore not known, from this context, what the current *London Plan* ‘enhance’ targets are based upon.

7.2 Rationale for new targets

The newly developed targets below represent estimates of achievable creation figures for each habitat and were individually discussed at length and agreed upon by the Trust and GiGL data managers. Each target factors in expected future land use, habitat creation difficulty, current understanding of habitat maintenance requirements and the increasing influence of climate change. It is recognised that with a rapidly expanding population, Greater London will contain a gradually more limited land resource from which to create new habitat.

Focus should be **weighted equally** between maintaining the existing resource and expanding those habitats in new locations. Despite no enhancement targets being proposed for monitoring reasons, habitat enhancements should be secured from the planning system wherever possible to ensure the existing resource is maintained and improved.

Targets are only recommended for those habitats that fulfil the following criteria:

¹⁴ Mike Waite, now with Surrey Wildlife Trust and one of the respondents on data, worked on the document and original target setting

- the habitat is easily defined and thus adequately identifiable even with minimal ecological experience and is thus favourable for ongoing monitoring to keep a record of change;
- the habitat extent can be feasibly increased within London, taking into account the aforementioned pressures of land use and environmental change.

Table 6 presents habitats for which increase targets are proposed based on the above criteria.

7.3 New targets

Table 6. Proposed habitat creation targets

Habitat type	Current net extent to be maintained under favourable management – 2016 figure (ha unless stated)	Target to increase in addition to total 2016 area for 2025 (ha unless stated)	Target to increase in addition to total 2016 area for 2041 (ha unless stated)
Increase targets proposed			
Reedbeds	144	5	30
Rivers and streams	614 km	10 km	30 km
Species-rich Woodland	7477	20	200
Flower-rich grassland	Unclear*	50	250

* the original habitat type meadows and pastures combined herb-rich lowland meadows with other grasslands or less ecological value.

Rationale

7.3.1 Reedbeds

Despite the target for *Reedbeds* apparently not being met, there is still much opportunity for habitat creation primarily because it is relatively easy to establish and has water filtration properties. The habitat also offers aesthetic appeal and it seems probable that significant areas could be created in future years. Nevertheless, reedbed installation will impact on open water habitats, and their uses for angling, and other leisure uses. Many interventions are likely to be small-scale as part of a suite of riparian habitat enhancements, as much to address natural flood management and water quality objectives as biodiversity. For these reasons the target is set at 15 ha for 2025 with an additional 10 ha by 2041.

7.3.2 Rivers and streams

Unlike the other habitat types, *Rivers and streams* has a target based upon restoration to reflect the target definition in the current *London Plan* and to facilitate continued monitoring. Restoration may refer to one or several of the following techniques:

- Installation of in-stream flow-alteration structures such as baffles, flow deflectors, large wood debris, gravel berms etc.
- Creation of back-waters and back-channels
- Removal of man-made structures/obstacles such as weirs, sluices etc.
- Bank re-naturalisation (e.g. removal of reinforced banks, riparian planting)
- Channel re-profiling (e.g. creation of shelves, inclusion of brush berms)

- Re-naturalisation of channel flow direction, i.e. meander creation
- De-culverting

Adoption of these interventions is a key part of catchment planning action being delivered by a number of partnerships across Greater London, driven in part by the objectives of the Water Framework Directive as well as a variety of floodwater management schemes. The current high-level of ongoing monitoring by the London Rivers Restoration Group of this habitat will allow for these targets to be accurately measured (and likely met).

7.3.3 Species-rich Woodland

The targets for this habitat are lowered from the original creation target and the habitat definition amended. This is because of much more ambitious plans to increase tree cover in London. We recommend that the habitat creation target should focus on the creation of woodland in the strictest sense. Planting schemes claiming to represent woodland (and which may have been classed as such in previous baseline surveys) potentially mask the creation of high quality woodland habitat and often do not necessarily represent ecologically important habitats. This target will therefore refer only to the creation of woodland incorporating;

- Structural diversity
- Native London tree and shrub species
- A woodland ground flora

There are opportunities to potentially create new woodland as contributions to natural flood management schemes and to help augment or connect existing areas of extant native woodland. There is potential to deliver these in parts of the Green Belt where more innovative land-uses would improve its value as an amenity and ecological resource.

7.3.4 Flower-rich grassland

The previous target related to the creation of lowland meadows that were intended to be facsimiles of herb-rich remnants of unimproved grasslands. The habitat type suggested here - flower-rich grassland – will not be as botanically rich as herb-rich lowland meadows, but will be easier to create and provide habitat for a range of pollinators, as well as adding to habitat diversity in many parks and greenspaces managed primarily for amenity. The proposed flower-rich grassland habitat type should comprise a range of native wildflower species present in grassland sward that is not dominated by perennial ryegrass.

There are opportunities for creating flower-rich grassland throughout London's network of parks and green spaces in areas not required to be closely mown for amenity purposes.

7.4 Habitats with low data confidence

Table 7 presents a suite of habitats that do not adequately fulfil all the criteria set out in Section 7.1 (see above) and for which confidence in the current net extent is low. These habitats may be adopted in future GLA policy and strategy where appropriate. Notional targets are also presented though only maintain targets are recommended for *Tidal Thames*, *Standing Water* and *Orchards*. *Coastal & floodplain grazing marsh* and *Open mosaic habitats on previously developed land* are not included due to the difficulty of attaining an accurate current net extent figure as result of habitat definition issues.

Table 7. Habitats with low data confidence

Habitat type	Current net extent to be maintained under favourable management– 2016 figure (ha unless stated)	Target to increase in addition to total 2016 area for 2025 (ha unless stated)	Target to increase in addition to total 2016 area for 2041 (ha unless stated)
Increase targets proposed			
Acid grassland	1523	10	15
Chalk grassland	336	15	25
Fen, marsh & swamp	124	5	8
Heathland	56	5	7
Lowland meadows	708	20	50
Orchards	50	-	-
Standing water	1,708	-	-
Tidal Thames	2,100	-	-

Rationale

7.4.1 Acid grassland

Acid grassland is geographically restricted by soil type, typically influenced by underlying bedrock. The potential of increasing this habitat is therefore constrained and as a result, the recommended creation target is low.

7.4.2 Chalk grassland

Chalk grassland is restricted to areas where the bedrock is of chalk, primarily in the southern boroughs. For this reason, increase targets are recommended to be kept rather low. However, as there appears to have been a decrease in extent since 2008 (likely due to scrubbing over), increases could be made with relative ease through scrub removal and a return to positive management on some sites.

7.4.3 Fen, marsh & swamp

Based on the moderate increase of 15 ha in extent calculated through this work, we propose modest creation targets of 5 ha and 8 ha. Recent high profile interest in wetland creation and a desire for a return to natural flood mitigation suggests that creation targets are both relevant and achievable.

7.4.4 Coastal and floodplain grazing marsh

We propose that there is no increase target for this habitat based on the difficulties of defining the habitat. This work has indicated significant ambiguities with estimating actual habitat extent based on the presence of potentially confusing ‘qualifier’ habitat features and future monitoring is likely to be strongly hindered by confusion with other habitat types (see section 5.5.4). Future monitoring of this habitat therefore seems haphazard at best. These issues also preclude the ability to make a

quantitative calculation of its current extent. Indeed it appears the 'habitat' largely comprises of a mosaic of habitats in current datasets, some of which are already priority habitats such as reedbeds.

7.4.5 Heathland

Heathland is given a low target due to the very specific conditions required for its establishment. The previous create target of 5 ha was met though potential heathland sites are likely to become more limited in the future.

7.4.6 Lowland meadows

The title of this habitat is changed to *Lowland meadows* from the London BAP habitat *Meadows and pastures* to reflect the more specific habitat that the target refers to and avoid confusion with pastures of low biological value such as horse-grazed fields, etc. *Lowland meadows* is also seen as a good translation of *Neutral grassland (herb-rich)* which is a habitat category in the London Survey Methodology. Furthermore, *Lowland meadows* is a priority habitat in the UK BAP and BARS (see chapter 3.2 BARS2 data) so is widely recognised by land managers.

7.4.7 Standing water

No increase target is proposed for *Standing water* as the habitat is very broadly defined and its creation can frequently replace other priority habitats. Furthermore, the current target refers specifically to ponds but this target would be difficult to monitor, as shown by the lack of land manager responses differentiating between ponds and other less biodiverse types of standing water.

7.4.8 Tidal Thames

No increase target is recommended for the *Tidal Thames* as increasing its extent is largely unfeasible. Interventions should instead focus on enhancement work such as the creation of 'natural' banks and improvements to water quality. This also precludes the appropriateness for length-based targets as interventions will be piecemeal or across the entire habitat (e.g. water quality improvements) area making target reviews unrealistic.

7.5 Alterations to updated habitat targets

7.5.1 Removal of 'enhance' targets

Following the workshop held at City Hall on 25th October, there was a generally accepted view that there shouldn't be an 'enhance' target in future policy and strategy. It was noted that defining and monitoring enhancement is a complicated process with a great deal of subjectivity between habitats. For instance, can removing litter be defined as enhancement to the same extent as de-culverting a river channel? Within the broad term, the variation in the scope of enhancement largely precludes its adequate implementation and subsequent accurate measurement.

Net increase in habitat coverage is far easier to measure quantitatively, but not necessarily qualitatively. For example, enhancing an area of woodland could be easily calculated in hectares covered but enhancement could be defined in a myriad of different interventions, including invasive species removal, under-planting, thinning, etc. - some offering greater value towards biodiversity 'quality' than others and varying heavily in extent and positive outcomes. The same applies to creation; dependent on specification, location, substrates, hydrology, etc.

Though enhancement is evidently clearly well-defined for some habitats (such as rivers and streams), it is, for example, far less easily defined for standing water where even small interventions in one area could be argued to have benefitted the entire water body but this is of

course extremely difficult to confirm and could significantly over-emphasise the scale of habitat enhancements.

7.5.2 Two increase targets for each habitat

Two increase targets have been recommended – one for **2025** and one for **2041**. This is to provide an opportunity to gauge ongoing progress towards meeting the distant 2041 target. The creation increase between 2025 and 2041 is lowered to reflect increasing urban pressure and the consequent reduction in potential space for habitat creation. For example, a target of 5 ha for *Heathland* is seen as feasible for 2016-25 but only an additional 2 ha (bringing the total to 7 ha) is set for 2025-41.

8. Recommendations

8.1 Retention of habitat targets in the Mayor's Environment Strategy

We recommend new creation habitat targets are created for:

- *Species-rich Woodland*
- *Flower-rich grassland*
- *Rivers and streams*
- *Reedbeds*

These should be included in the Mayor's forthcoming Environment Strategy (ES). These habitats are underpinned by the most accurate baseline data of all priority habitats reviewed and are most likely to be adequately monitored going forward. They are also habitats that can be created to deliver other outcomes (such as improving flood management and water quality) or relate to other priorities (such as increasing tree cover).

We do not recommend, however, there is sufficient justification for any habitat targets to be retained in the forthcoming *London Plan*, as the data is not sufficiently robust to withstand scrutiny at the Examination in Public stage.

A link should be made between the strategy and the *London Plan*, for example explicit reference to enhancing and extending existing habitats of conservation importance and the SINC network. There will be additional benefit in the ES by spatially representing these habitats of conservation importance and SINC as ecological networks (as set out in paras 109 and 114 of the National Planning Policy Framework) so as to guide future delivery of where these may best take place.

Commitments to retaining the current extent and quality, and creation of new habitats of conservation importance should also be included in the ES, with reference in the *London Plan* as appropriate. These are:

- *Acid grassland*
- *Chalk grassland*
- *Fen, marsh & swamp*
- *Lowland meadows*
- *Coastal & floodplain grazing marsh*
- *Open mosaic habitats on previously developed land*
- *Orchards*

Commitments to retaining the current extent and quality of these habitats, and gaining a more accurate assessment of their extent, should also be included in the ES. Given that there is less confidence in their current net extent and the feasibility of their future monitoring to a precise means, no discrete targets should be set.

8.2 Future habitat monitoring

This report has exposed the complexity of obtaining, managing and analysing habitat data over a relatively short time span. Whilst this in some way reflects the complicated and fragmented nature of land ownership and political structures in London, it nevertheless poses problems for effective conservation planning. Complex and, in some respects, conflicting datasets have served to highlight the necessity of developing a more effective means to monitor habitat extent and quality in the future. This is essential if habitat conservation is to be effectively measured, and that the impacts of interventions can be successfully tracked in order to determine future policy and practice.

In terms of spatial planning the impacts of future development – and the opportunities it may be able to secure for biodiversity - will only be as effective strategically if the datasets are robust, and

consistent over time and space. This requires a move away from reliance on BARS-style (i.e. crowdsourced) monitoring and the exploration of automated methods. This may be through remote digital sensing, for example by using drones, or Unmanned Vehicle Systems (UAVs). This is already being trialled for a number of different land use assessment purposes. For example, RSPB have used drones to monitor nests of vulnerable birds, UCL are trialling static sensors for bats in the Queen Elizabeth Olympic Park, and London Wildlife Trust has trialled drone camera habitat assessment of one of its nature reserves.



UAV images of Hutchinson's Bank, New Addington (c) Don Lewis

There are considerable constraints for the widespread adoption of UAV imaging in London, not least cost and privacy issues. Nevertheless, the evolution of sensing technologies, and the means to which these are assisting in a broader development of green infrastructure policy, provides an opportunity for biodiversity conservation practitioners to investigate this further.

8.3 A new priority habitat data portal for London

Even with the potential adoption of remote sensing and monitoring there needs to be consideration of how and where such data is held and managed. The closure of BARS2 closes the door on a habitat conservation reporting system. However, whilst BARS2 wasn't widely adopted by biodiversity conservation practitioners across London, there was anecdotal support from practitioners for having a system in place in London, with GiGL being the appropriate manager of such a system.

We therefore recommend that the development of a managed platform that seek to effectively capture relevant habitat intervention work in London, is explored.

GiGL have indicated their interest in evaluating how this could be developed, but further information is outside the scope of this review.

9. Conclusions

9.1 Concluding remarks

This report has revealed significant constraints on the acquisition of data to gain an accurate overview of priority habitat changes in London over the past eight years. Of these constraints, the poor number of responses from data owners resulted in a low return of information which presented gaps, particularly with some London borough councils who failed to provide data. By assessing the locations of particular data gaps, the review team were (in some instances) able to 'fill' gaps by examination of existing data sets held by GiGL and any relevant data present on BARS2 (post-2008). This process was largely successful in circumventing the poor responses but due to the temporally inconsistent nature of survey data held by GiGL this was not always possible as the most recent available data pre-dated 2008.

This patchiness of data has resulted in an inconsistent overview of priority habitats with some being relatively accurately recorded (e.g. rivers and streams), whereas others appear to have been afforded very little recording attention (e.g. heathland). This is likely be amplified by geographical location where a habitat may fall primarily in areas of little or no recent survey effort.

A selection of habitat targets appear to have been met, whereas for some we have been unable to confirm their fulfilment due to apparent discrepancies in the baseline figures presented in the *London Plan*.

We recognise that future monitoring of the habitats recommended for increase targets in Table 6 could be challenging but with adequate resourcing, reporting on habitat change is achievable. In order to meet ongoing monitoring requirements and assess habitat target fulfilment in any future reviews, data must be adequately captured (ideally) in a centralised location and avoid repeating the lengthy process of data acquisition and interrogation set out in this report (see below). We suggest that a London-based system is investigated.

Furthermore, whilst we were unable to confirm to an accurate extent those habitat interventions directly influenced by the planning system, it is likely that most positive change was carried out independently of planning, i.e. through land management. An accurate assessment method would involve investigating planning application decisions that have been subject to habitat intervention conditions. This is beyond the scope of this report.

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Mr	Alastair	Driver	Environment Agency
Ms	Thea	Cox	Environment Agency
Mr	Steve	Peters	Environment Agency
Mr	Dave	Webb	Environment Agency
Mr	Craig	Harrison	Forestry Commission
Mr	Ian	Holt	LB Bexley
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Mr	Sam	Parry	LB Hackney
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Mr	Simon	Parkinson	LB Havering
Mr	Benjamin	Sanderson	LB Havering
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Ms	Julia	Coulson	LB Redbridge
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Mr	Jon	Best	LB Southwark
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Mr	John	Archer	LB Tower Hamlets
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Mr	John	Bryden	Thames 21
Mr	Ian	Crump	Thames Water SE
Ms	Karen	Sutton	Thames Water Utilities Ltd
Mr	Simon	Pile	The Land Trust
Mr	Colin	Buttery	The Royal Parks
Mr	Alister	Hayes	The Royal Parks
Ms	Claudia	Watts	The Royal Parks
Ms	Kate	Sheldon	Trees For Cities
Mr	Adam	White	Volker Fitzpatrick
Mr	Richard	Bullock	Wildfowl & Wetlands Trust
Mr	Richard	Barnes	Woodland Trust

Appendix 1: List of organisations contacted

Alexandra Palace & Palace Charitable Trust	Lee Valley Regional Park Authority
Canals & Rivers Trust	London Legacy Development Corporation
City of London	London Natural History Society
City of Westminster	London Orchard Project
Colne Valley Regional Park	London Parks & Green Spaces Forum (now Parks for London)
Ecology Consultancy Ltd	London Underground Ltd
Environment Agency	London Wildlife Trust
Forestry Commission	National Trust
Froglife	Natural England
Green Corridor	Network Rail
Groundwork London	Port of London Authority
Heathrow Airport Holdings	RB Greenwich
LB Barking and Dagenham	RB Kensington and Chelsea
LB Barnet	RB Kingston Upon Thames
LB Bexley	The Royal Parks
LB Brent	RSPB
LB Bromley	TCV
LB Camden	Thames 21
LB Croydon	Thames Estuary Partnership
LB Ealing	Thames Landscape Strategy
LB Enfield	Thames Water SE
LB Hackney	Thames Water Utilities Ltd
LB Hammersmith & Fulham	The Crown Estate
LB Haringey	The Land Trust
LB Harrow	Trees For Cities
LB Havering	Volker Fitzpatrick
LB Hillingdon	Wandle Trust
LB Hounslow	Wandle Valley Regional Park Trust
LB Islington	Wildfowl & Wetlands Trust
LB Lambeth	Woodland Trust
LB Lewisham	Zoological Society of London
LB Merton	
LB Newham	
LB Redbridge	
LB Richmond upon Thames	
LB Southwark	
LB Sutton	
LB Tower Hamlets	
LB Waltham Forest	
LB Wandsworth	

Appendix 2: GiGL-LBP habitat translations

Identifying the BAP habitats within existing baseline data

Introduction

The Biodiversity Action Plan (BAP) habitat target assessment and setting project needs to assess the recorded areas of thirteen BAP habitats within current datasets. This baseline can be used to make a good assessment of what the next targets should be.

A habitat survey methodology for London (referred to here as the London Survey Method) was first developed in the mid-eighties, when the Greater London Council commissioned London Wildlife Trust to complete the first comprehensive survey of wildlife habitats in Greater London and officially updated by the London Mayor in his Biodiversity Strategy in 2002.

The London Survey Method and habitat categories were used during a rolling programme of surveys, from the mid-eighties to 2009. The habitat survey data from that programme were collated by GiGL into a GIS habitat dataset for London.

The categories include eight of the thirteen BAP habitats listed in the London Plan, which would have been directly recorded. The others require some interpretation.

In 2009, LBP and GiGL worked with Habitat Action Plan groups and other London experts to assess the condition of nine BAP habitats based on the existing London Survey Method data and other sources of information. This process involved the 'translation' of certain BAP habitats that are not explicitly recorded as part of the London Survey Method. This dataset therefore provides potential identifiers for habitats not otherwise captured in the survey but relevant to BAP habitat target setting and future work.

Surveys are undertaken by land owners in London using other kinds of standard survey methodology, Extended Phase I and National Vegetation Classification, some more recent data is available for certain sites in this format and may need to be considered separately.

Below each of the BAP habitats referenced in the *London Plan* is considered from the point of view of datasets managed by GiGL and the definition of that habitat or its translation. These are taken from the BAP habitat condition assessment project translations, with exceptions noted.

1. Coastal and floodplain grazing marsh

Is not available as a London Survey Method category, but has been translated out of the survey data as part of the condition and suitability assessment modelling as “Flood plain grazing marsh”.

Flood plain grazing marsh parcels were identified as those containing:

Neutral Grassland habitat

09	Neutral grassland (semi-improved)	Mesotrophic grassland usually with one or more of <i>Arrhenatherum elatius</i> , <i>Deschampsia cespitosa</i> , <i>Alopecurus pratensis</i> , <i>Cynosurus cristatus</i> , <i>Dactylis glomerata</i> , <i>Festuca arundinacea</i> or <i>F.pratensis</i> . Contains more than just <i>Lolium perenne</i> , <i>Trifolium repens</i> , <i>Rumex acetosa</i> , <i>Taraxacum</i> , <i>Bellis perennis</i> and <i>Ranunculus</i> species (see 07 and 11), but lacks the characteristic forbs of 35. Excludes reedswamp (17).
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or

Amenity Grassland Habitat

07	Amenity grassland	Usually frequently mown, species-poor mesotrophic grassland characteristic of parks and sports pitches, containing similar species to 11. Scattered trees and shrubberies in parks should be coded separately.
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or

Improved Grassland habitat

11	Improved or re-seeded agricultural grassland	Species-poor mesotrophic grassland containing little but <i>Lolium perenne</i> , <i>Trifolium repens</i> , <i>Agrostis</i> species, <i>Bellis perennis</i> , <i>Taraxacum</i> and <i>Ranunculus</i> species. Distinguished from 07 by its agricultural use and hence usually less frequent mowing.
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or

Herb-Rich Grassland habitat

35	Neutral grassland (herb-rich)	Mesotrophic grassland with more forbs typical of old grassland than 09. Likely to contain one or more of <i>Primula veris</i> , <i>Lychnis flos-cuculi</i> , <i>Achillea ptarmica</i> , <i>Silaum silaus</i> , <i>Succisa pratensis</i> , <i>Stachys officinalis</i> , <i>Serratula tinctoria</i> , <i>Ophioglossum</i> , <i>Gensita tinctoria</i> , <i>Sanguisorba officinalis</i> or <i>Caltha palustris</i> , or an abundance of <i>Carex ovalis</i> , <i>Pimpinella saxifraga</i> , <i>Conopodium majus</i> , <i>Cardamine pratensis</i> , <i>Knautia</i> or <i>Filipendula ulmaria</i> .
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and

The following ‘qualifiers’:

- *Wet grassland or Grassland with flush*
- *Drainage ditches* **Note: this was not included as a qualifier in the translations for the current project**

2. Chalk grassland

Is available as a London Survey Method category

10	Basic grassland	Un- or semi-improved grassland containing calcicoles. Usually with some of <i>Brachypodium pinnatum</i> , <i>Bromopsis erecta</i> , <i>Helictotrichon pratense</i> , <i>Thymus polytrichus</i> , <i>Sanguisorba minor</i> , <i>Centaurea scabiosa</i> or <i>Origanum vulgare</i> in some abundance.
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3. Acid grassland

Is available as a London Survey Method category

08	Acid grassland	Un- or semi-improved grassland on acidic soils, with less than 25% cover of heather or dwarf gorse. Excludes reedswamp (17). Usually with one or more of <i>Deschampsia flexuosa</i> , <i>Molinia caerulea</i> , <i>Nardus stricta</i> , <i>Juncus squarrosus</i> , <i>Galium saxatile</i> , <i>Potentilla erecta</i> or <i>Rumex acetosella</i> in abundance.
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4. Heathland

Is available as a London Survey Method category

15	Heathland	Dwarf-shrub cover greater than 25% of species such as heathers and <i>Ulex minor</i> , with less than 50% cover of <i>Sphagnum</i> . May include a large amount of acid grassland (06) in a close mosaic, but code as a mixture if grassland areas are large.
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5. Reedbed

Is available as a London Survey Method category

17	Reedswamp	Stands of <i>Phragmites australis</i> with at least 75% cover of reeds. Includes dry and tidal stands.
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6. Woodland

Is available as multiple London Survey Method categories (01, 02, 03)

01/02/03	Woodland	Stands of trees forming at least 75% cover, including coppice and trees of shrub size, but excluding fen carr (19). Includes stands of willow except <i>Salix cinerea</i> , <i>caprea</i> and <i>viminalis</i> , but excludes hawthorn, hazel (except hazel coppice with standards), elder, juniper and the three willow species listed above, which are always scrub (06) regardless of height. Where the species composition does not fulfil any of 01, 02 or 03 below, code as a mixture. Always record % shrub layer under the qualifiers.
01	Native broadleaved woodland	Woodland (see above) with native broadleaved species (i.e. excluding sycamore and sweet chestnut) comprising at least 75% of the canopy.
02	Non-native broadleaved woodland	Woodland (see above) with non-native broadleaved species (including sycamore and sweet chestnut) comprising 75% of the canopy.
03	Coniferous woodland	Woodland (see above) with coniferous species (including yew) comprising 75% of the canopy.

7. Orchards

Is available as a London Survey Method category

31	Orchard	Planted fruit or nut trees forming at least 50% canopy cover.
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8. Meadows and pastures

Is not available as a London Survey Method category, but 'Lowland Meadow' has been determined to be represented by a survey category as part of the condition and suitability assessment modelling.

Natural England Lowland grass inventory methods were inspected and the five definitions compared with the grassland definitions within the London survey method categories.

- London habitat experts and Graham Hawker were consulted
- Reference made to I.H.S. translation carried out by SERC on GLA data in 2006
- Translations agreed were:
- Lowland meadows = London Survey Method Neutral grassland (herb-rich)

35	Neutral grassland (herb-rich)	Mesotrophic grassland with more forbs typical of old grassland than 09. Likely to contain one or more of <i>Primula veris</i> , <i>Lychnis flos-cuculi</i> , <i>Achillea ptarmica</i> , <i>Silaum silaus</i> , <i>Succisa pratensis</i> , <i>Stachys officinalis</i> , <i>Serratula tinctoria</i> , <i>Ophioglossum</i> , <i>Gensita tinctoria</i> , <i>Sanguisorba officinalis</i> or <i>Caltha palustris</i> , or an abundance of <i>Carex ovalis</i> , <i>Pimpinella saxifraga</i> , <i>Conopodium majus</i> , <i>Cardamine pratensis</i> , <i>Knautia</i> or <i>Filipendula ulmaria</i> .
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9. Tidal Thames

Is not available as a London Survey Method category, but the area can be defined and was subject to survey.

The note in the *London Plan* table states "includes habitat features found with the tidal Thames including mudflats, saltmarsh and reedbeds", which may help to define the area.

10. Rivers and streams

Is available as a London Survey Method category

22	Running water	Rivers and streams. Always code vegetated margins separately and note trophic status and whether saline or tidal.
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11. Standing Water (includes canals)

Is available as a London Survey Method category

20	Standing water (includes canals)	Lakes, reservoirs, pools, wet gravel pits, ponds, canals, docks and brackish lagoons beyond the limit of swamp or wet marginal vegetation. Always code vegetated margins separately and note trophic status and whether saline or tidal.
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12. Fen, marsh and swamp

Not available as single London Survey Method category. However, similar categories are available in London Survey Method data. Select best fit?

40	Typha, etc. swamp	Stands of <i>Glyceria maxima</i> , <i>Typha</i> species or <i>Phalaris arundinacea</i> where these species form at least 75% cover.
19	Fen carr	Woodland or scrub over herbaceous vegetation with the water table above ground for most of the year.
16	Bog	Dominated by Sphagnum mosses (greater than 50% cover) with water table at or just below the surface.

13. Open mosaic habitats on previously developed land

Not available as a London Survey Method category, was translated for condition assessment during the BAP habitat condition and suitability assessment project. It appears the previous use of the site was not considered. The habitat only translation is given below.

Methods were based on interpretation of the Buglife 'All a Buzz' project site assessment form and 'Wasteland/Brownfield' parcels were identified if they included a particular London Survey Method category and one of two other London Survey Method categories:

33	Roughland	An intimate mix of semi-improved neutral grassland (09), tall herbs (14) and scrub (06). If these occur in large enough patches they should be coded separately. Usually the next successional stage after 12.
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OR

26	Bare soil and rock	Includes active quarries, fresh road workings, spoil or tipping and earth banks of water habitats, where these are minimally vegetated. Excludes arable land (28).
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AND

12	Ruderal or ephemeral	Communities composed of pioneer species such as occur in early succession of heavily modified substrates. Typical species include <i>Senecio squalidus</i> , <i>S. vulgaris</i> , <i>Sinapis arvensis</i> , <i>Poa annua</i> , <i>Hirschfeldia incana</i> and species of <i>Polygonum</i> , <i>Persicaria</i> , <i>Melilotus</i> , <i>Atriplex</i> , <i>Chenopodium</i> , <i>Medicago</i> , <i>Vulpia</i> , <i>Picris</i> , <i>Lactuca</i> , <i>Diplotaxis</i> , <i>Conyza</i> and <i>Reseda</i> .
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Appendix 3: Overview and role of GiGL

Greenspace information for Greater London (GiGL) is the local environmental records centre for London; working to mobilise, curate and share access to data that underpin our collective knowledge of London's natural environment. Originally established by London Wildlife Trust in 1996, it is now an independent Community Interest Company.

One of the most significant outcomes from GiGL's partnership work with the GLA and other partners has been an expansion from a traditional biological records centre, focusing on wildlife records, to one that handles a much wider suite of habitats and open space information. The habitat survey data from the rolling borough survey programme were digitised and these mapped data were collated by GiGL to form a baseline GIS habitat dataset for London.

Another significant GiGL partnership project has been the London Biodiversity Partnership led project in 2009 to analyse the habitat baseline data for the presence and estimated condition of several London BAP habitats. The potential for expansion, restoration or creation of these habitats was also modelled. This project defined a methodology, in collaboration with the working Habitat Action Plan groups for each London BAP habitat, for identifying and assessing the habitats purely based on the available baseline data.

GiGL encourages the collection of habitat-per-parcel spatial data to overcome this problem. GiGL has also carried out a review of its habitat database infrastructure and will be undertaking a project of development, aiming to better automate habitat integration. This will aim to speed up data integration, helping with the process of verification and will also have the positive outcome of making the translation of BAP habitats much easier in future.

Role of Greenspace Information for Greater London CIC

GiGL have provided the technical ability to collate and interrogate the habitat data received from land managers and extracted from existing data sets which GiGL manage on behalf of partners. Expanded data attributes enable newer survey information to be incorporated including more recent borough SINC surveys.

The baseline information appropriate for assessment of BAP habitats in this project was derived from the rolling borough habitat survey programme (1984-2009) and other more recent surveys were analysed separately.

Appendix 4: Methodology: extra information

Detailed overview of data sources

- **London survey data (1984-2009)**
 - Background: most of the data within the current GiGL habitat dataset and component data represent survey results from the London Wildlife Habitat Survey programme, commissioned by the Greater London Council in 1984, and from 1986 carried forward by the London Ecology Unit (LEU), and then from 2000 to 2009 by the Greater London Authority (GLA).¹⁵ This focussed on mapping every green space >0.25ha outside of private gardens, and represented the first and last full 'snapshot' of the state of London's habitats. All boroughs have been surveyed at least once between this period using a London-specific methodology (LEU, 1994; GLA, 2004). This provides a background baseline of habitat extents for each borough.
 - Use: This data was only used for land parcels that had not been resurveyed (at least partially) since (and data made available).
 - Methodology and quality: The recorded survey categories and data quality are largely consistent and good. Some errors arising in transcription from paper to digital maps are present to an unknown extent. However, the dataset was effectively verified as reliable by working Habitat Action Plan groups regarding BAP habitats during the LBP-GiGL habitat condition assessment and suitability modelling project in 2009. Translation from the recorded survey categories to BAP habitats was straight-forward for most habitats e.g. acid grassland, chalk grassland, but required interpretation for some e.g. meadows and pastures and floodplain grazing marsh. Translations were adopted from the methods developed during the LBP-GiGL BAP habitat assessment modelling (see Appendix 2).
 - Coverage: Parcels of land of 0.25 hectare or greater were surveyed (with the exception of Croydon, which had a 0.5 hectare cut-off).
 - Age: There is, naturally, more confidence in the data baselines from boroughs that were surveyed more recently in the survey programme due to the likelihood of less change in intervening years.
- **Re-survey data (2011-15)**
 - Use: Data were used to calculate BAP habitat extents for parcels that had been re-surveyed, instead of the older baseline.
 - Methodology and quality: Surveys had been carried out to a professional standard and digitally mapped well. All but one borough dataset used the London Phase I survey method. One borough dataset was recorded in JNCC Phase I categories. Translations from the London Phase I categories were as for the older baseline data, translations from JNCC Phase I categories were different, outlined in the appendix. These differences in recorded categories and translations will introduce some potential variation.
 - Coverage: Data were available for five boroughs. All but one borough dataset were of partial coverage survey focusing on SINC's, one borough had completed a comprehensive survey of all open spaces. Practically this partial coverage presents some problems with replacing older data where parcels do not align on a boundary-to-boundary basis. A conservative approach was taken to avoid duplication so data

¹⁵ A few boroughs were surveyed (in part or whole) in 1983 and 1984, independent of the WHS.

from newer parcels were included entirely but data from older parcels only where there was no, or less than 95% overlap with newer parcels. This will have led to some minor losses of data in neighbouring parcels, however SINC sites will have been fully included.

- Age: re-survey data were in all cases newer than the available baseline, and in many cases represent close to the current situation for surveyed sites.
- **BARS2 records (2008-16)**
 - Background: BARS was originally created to support the UK Biodiversity Action Plan (UKBAP) and allowed organisations, companies and partnerships to manage and share their own Biodiversity Action Plans. The UKBAP closed in 2011 and the last version of BARS was launched in April 2012 to collate biodiversity actions in a standardised form and capture geographic locations – enabling spatial analysis and reporting of activity (<http://jncc.defra.gov.uk/page-7342>). However, BARS2 closed on 30th November 2016, with reasons given as "Uptake of the system was limited and it failed to present a comprehensive picture of biodiversity action across the UK" (<http://jncc.defra.gov.uk/page-7342>).
 - Use: reports on activities listed as complete and reporting increases to habitat extent (by area) provided additional habitat extents to update area baselines.
 - Methodology and quality: Users report on UK BAP habitat categories, so these needed to be translated to London equivalents. The data will be subject to reporter variation as the information has been input by 10 different organisations. Note that reports made to 'site' level were not included due to the difficulty determining the real habitat extent in these cases. Reports measured as lengths were also excluded as most London Plan BAP habitat area measurements.
 - Coverage: BARS platform can be used by any registered user for any site, but not all land managers use the platform so coverage is distributed unevenly across 16 boroughs.
 - Age: All reporting was subsequent to the original comprehensive borough survey data. Checks of dates and locations of BARS2 data that could potentially duplicate re-survey data were made and areas pertaining to sites captured already were removed.
- **Land manager's data**
 - Background: Prominent land managers who actively maintain, enhance, restore or create priority habitats in Greater London were identified and collectively emailed on 2nd September 2016 with an initial overview of the target review scope and general details. All London boroughs (and the City of London), five private companies/corporations and a total of 31 NGOs and agencies were contacted. The wording of both e-mails was carefully worded in order to encourage data sharing by stressing the importance of the London Plan habitat targets for guiding planning, for setting future targets and for accurately assessing the success of the current targets. Partners were asked to confirm the following:
 - whether they were the right contact;
 - how easy/long it would take them to procure the data;
 - whom else they thought might have important information to share;
 - the format of the data being passed on.

This resulted in a modest response from 23 partners within a week. A second email was sent out to the same list of contacts on 6th October with an attached data collection spreadsheet which partners were requested to fill in. This spreadsheet was designed to be as simplistic as possible and thus facilitate the passing on of data. A third email was sent out to partners who failed to respond to the second email on 2nd November. This was then followed up with phone calls to help secure data where possible. Voluntary sector organisations, agencies and companies who had not responded in the first instance did not receive a third follow-up email request and were not phoned either. This was because the most influential partners (in terms of habitat management extent) had already replied so this was not required. For example, the Environment Agency and Thames Water Ltd. were able to provide numerous sources of accurate data relatively quickly. Organisations who are known to have only a small share in habitat conservation in London were therefore not contacted again.

- Use: Creations of habitat area were added to the emerging baseline where not duplicating other information. Losses were deducted. Enhancements reported since 2008 were separately calculated.
 - Methodology and quality: reporting will vary from respondent to respondent. Many reports are based on personal knowledge of sites and activities, some will relate to local reporting. There is likely to be variation in the interpretation of habitat definitions and the meaning of enhancement or creation.
 - Coverage: responses are detailed elsewhere in this report.
 - Age: Three reports were found to have overlapping dates and locations with re-survey data/BARS2 data, so were removed to avoid duplication.
- **Other sources**
 - Some additional sources were found appropriate to supplement the sources above, for example Habitat Action Plan documents from Croydon Council for heathland and chalk grassland. In these cases, figures for the whole borough replaced older source area.

Workshop, City Hall

Discussion with a number of selected representatives from contacted organisations was seen as pivotal in order to gain a broad understanding of habitats and London regions to inform the ongoing work.

A workshop was therefore organised at City Hall (hosted by the GLA) on 25th October where a selection of borough council representatives, agencies and NGOs were invited to discuss the current London Plan targets and pool knowledge on future target setting. This was also an opportunity to present the progress of the work being undertaken.

Appendix 5: Data constraints and discussion

Land manager consultation

The table below indicates the varying success of data procurement from the London boroughs.

London borough data responses

Contact established, data received	Contact established, data offered but not yet received	Contact established, no data to offer	Contact established, unable to establish subsequent contact	No contact established
14	5	6	2	6

Less than half of all London boroughs provided habitat data which is an unsatisfactory baseline from which to build an accurate overview of habitat works undertaken in London. Although some recent surveys (such as SINC reviews) have taken place in some boroughs over the same time period, these do not necessarily provide a complete picture of the boroughs' habitat works.

For some bodies, high staff turnover and organisational restructure has resulted in new staff being tasked with the process of collating habitat data from an area for which they may have little or no background knowledge. This has caused some issues where the contact has been unfamiliar with their organisation's internal structure and thus where to direct the request to a more suitably placed colleague or find the necessary data. The knock-on effects mean extra time has been lost in some instances leaving a narrowing opportunity for data to be collated and passed on.

Similarly, a few data requests have, in the first instance, reached the wrong department entirely or staff who have now left their post. This has created further set-backs in attaining data whilst ongoing discussion takes place in the process of locating the correct person(s).

In some instances, no contact was established meaning some bodies have failed to pass on any data at all. This has meant that for some areas extents are based on existing baselines, which in some cases are over ten years old, and do not reflect any local creation activity or losses. There will be no enhancement data calculated for these organisations/locations.

The above is further exacerbated by significant budget cuts to the borough councils where staff are stretched with little time or impetus to pull together large datasets of habitat works. This is of course assuming that data has been captured but in some cases the data had not been recorded at all presumably as a direct result of resourcing constraints.

In addition, the inconsistency of data quality and subjectivity of the interpretation of habitat definitions and categories make the data received from land managers relatively poor.