

# DESIGN FOR BIODIVERSITY

A guidance document for development in London

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DEVELOPMENT  
AGENCY

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**LONDON**  
DEVELOPMENT  
AGENCY

**MAYOR OF LONDON**



**ENGLISH  
NATURE**

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## 1. Introduction

Many developers are beginning to recognise the importance of the environmental agenda to their work, integrating environmentally sensitive approaches into their development and regeneration activities.

London is a dynamic city. In order to keep up with its world competitors, London must continue to provide ever better facilities for people to live and work in. Consequently, development should be sustainable, focused on previously developed land, while protecting and enhancing open space and environmental assets.

This brochure provides general guidance for developers on biodiversity. It outlines the critical drivers and principle processes which promote industry best practice. It also provides three case studies that demonstrate how nature conservation priorities have been achieved in development.

London is a city rich in wildlife, where nature provides an environmental service and direct contribution to quality of life. The Mayor of London acknowledges that conserving London's biodiversity is an integral part of achieving sustainable economic growth and promoting social inclusion in the capital.

"My vision is to develop London as an exemplary sustainable world city"

**Ken Livingstone, Mayor of London**

Photo credits left to right:  
1,3,5,7 Mathew Frith/English Nature, 2,4,6,8 Mike Waite



## 2. What is biodiversity and why conserve it?

The word 'biodiversity' simply refers to all living things. All plants and animals contribute to our planet's biodiversity and each individual species plays its own unique part in this.

It is well documented that throughout the twentieth century, the increased modernisation of our lives has harmed biodiversity. The pressures of urban expansion place an ever-increasing demand on natural resources in London. In order to prevent further detrimental effects, it is imperative that we share responsibility to conserve and enhance biodiversity.

'Biodiversity - the variety of life on earth - is at the heart of our aim for a more sustainable future. We have a duty to ensure a diverse and thriving natural environment for it is essential to the economic, social and spiritual health and well being of this and future generations.'

**Biodiversity Strategy  
for England, 2002**

### Decline in biodiversity: water vole

Water voles have disappeared from over half of their mid-1990s range in London. Furthermore any remaining populations tend to be isolated from one another. The main factors causing the decline in water vole numbers include: deterioration, fragmentation and loss of habitat; predation by mink; and rat poisoning. By retaining wetland links and providing suitable habitat, developers can help maintain and enhance current water vole populations in London.

[www.wildlondon.org.uk/wildinfo/watervoleproject.htm](http://www.wildlondon.org.uk/wildinfo/watervoleproject.htm)

Photo credit:  
Courtesy of London Wildlife Trust  
© Terry Whittaker



## 3. Biodiversity and development

Development and biodiversity conservation can work together through adherence to relevant legislation, national and regional planning policies and biodiversity strategies and action plans. Developers who take a proactive approach can use these key drivers to design and build quality developments that meet biodiversity objectives.

### Legislation

European legislation, notably the Habitats Directive, 1992, has greatly strengthened the protection afforded to wild species and habitats. The Wildlife and Countryside Act, 1981 (as amended) is the key piece of legislation that underpins the conservation of the UK's species and habitats.

Sites and species are afforded both statutory and non-statutory protection. Table 1 illustrates some of the key elements of these frameworks.

[www.defra.gov.uk/wildlife-countryside/ewd](http://www.defra.gov.uk/wildlife-countryside/ewd)

### Planning policy guidance

Planning Policy Guidance 9, 'Nature Conservation' (1994) states that 'the Government's objectives for nature conservation are to ensure that its policies contribute to the conservation of the abundance and diversity of British wildlife and its habitats, or minimise the adverse effects on wildlife where conflict is unavoidable'. It seeks to integrate conservation into development objectives.

[www.planning.odpm.gov.uk/ppg](http://www.planning.odpm.gov.uk/ppg)

### Working with the Grain of Nature: the Biodiversity Strategy for England

The England Biodiversity Strategy, published in 2002 provides the vision for the conservation of our biodiversity resources over the next five years and beyond. Amongst other things, it promotes development that makes minimal adverse impacts on wildlife habitats and the enhancement, wherever possible, of biodiversity resources. It outlines the integral role of biodiversity conservation in ensuring sustainable urban communities in the built environment.

[www.defra.gov.uk/wildlife-countryside/ewd](http://www.defra.gov.uk/wildlife-countryside/ewd)



© Mathew Frith/English Nature



**Table 1**  
**Protection through legislation and guidance**

	Statutory protection	Classification examples	Key legislation and guidance
Sites	It is a requirement to consult with the relevant statutory authority before undertaking any operations potentially damaging to a protected site	<ul style="list-style-type: none"> <li>Special Protection Areas</li> <li>Special Areas of Conservation</li> <li>Ramsar Sites (wetland sites protected worldwide)</li> <li>Sites of Special Scientific Interest</li> </ul>	<ul style="list-style-type: none"> <li>Council Directive (92/42/EEC) on the conservation of natural habitats and of wild fauna and flora ('Habitats Directive'), 1992</li> <li>Wildlife and Countryside Act, 1981 (as amended)</li> <li>Countryside and Rights of Way Act, 2000</li> <li>Planning Policy Guidance 9: Nature Conservation (1994)</li> </ul>
Species	It is a requirement for developers to avoid or mitigate adverse effects if protected species are present on the site	Specially protected species are listed in the Schedules appended to the Wildlife and Countryside Act, in the Habitats Regulations, or in their own legislation. The Schedules are reviewed every 5 years	
	Non-statutory protection	Classification examples	Key guidance
Sites	Three tiers of Sites of Importance for nature conservation in London:	<ul style="list-style-type: none"> <li>Sites of Metropolitan Importance</li> <li>Sites of Borough Importance</li> <li>Sites of Local Importance</li> </ul>	<ul style="list-style-type: none"> <li>Connecting with London's Nature: the Mayor's Biodiversity Strategy, 2002</li> <li>Draft London Plan, 2002</li> <li>UK Biodiversity Action Plan, 1994</li> <li>London Biodiversity Action Plan, 2001</li> <li>Working with the Grain of Nature: a biodiversity strategy for England, DEFRA, 2002</li> </ul>
Species	Species and habitats given priority in a Biodiversity Action Plan (national, London or local):	<ul style="list-style-type: none"> <li>UK: 391 priority species and 45 priority habitats</li> <li>London: 22 habitat and species action plans and a further 310 priority species. Some extra species are national or local priorities</li> </ul>	



**Biodiversity Action Plan process**

The UK Biodiversity Action Plan (BAP) is the means by which the Government sets out to fulfil its international biodiversity obligations. The UK BAP encompasses almost 400 species and 45 habitats considered to be rare, declining or in need of some protection to ensure their long-term survival. Further objectives are found in local BAPs. The London BAP will have 22 habitat and species action plans, and a further 310 priority species are listed in its audit. Development should contribute to their protection and enhancement.

[www.ukbap.org.uk](http://www.ukbap.org.uk)  
[www.lbp.org.uk](http://www.lbp.org.uk)



## The London Plan and Mayor's Biodiversity Strategy

Through the draft London Plan published in 2002, the Mayor expects future development to meet the **'highest standards of sustainable design and construction'**. The conservation and enhancement of biodiversity resources in the Capital is a key theme of the Plan and is underpinned by the Mayor's Biodiversity Strategy, 2002. Both documents emphasise that addressing biodiversity conservation not only has a positive impact on wildlife in the city but also on the people that live there.

The Mayor's Biodiversity Strategy aims to **'protect and enhance the natural habitats of London together with their variety of species'**.

Its policies and proposals for statutory planning are integrated with those of the draft London Plan. The Strategy addresses the range of issues for biodiversity conservation in London, including the greening of development.

[www.london.gov.uk/mayor/strategies/sds/](http://www.london.gov.uk/mayor/strategies/sds/)

### Mayor's Biodiversity Strategy - proposals of particular importance for developers

**The following proposals from the Biodiversity Strategy and the draft London Plan are of particular importance for developers, and indicate the Mayor's resolve to work with partners to protect, manage and enhance biodiversity.**

#### The Mayor will:

- Protect Sites of Importance for Nature Conservation, with particular emphasis on Sites of Metropolitan Importance;
- Resist development that would have adverse impacts on the population or conservation status of protected or priority species;
- Take account of wildlife habitats in the consideration of all planning applications; and

- Ensure new development capitalises on opportunities to create, manage and enhance wildlife habitats and natural landscapes.

Where, exceptionally, development is permitted which would have an adverse impact on a Site of Importance for Nature Conservation or other local designation, or on the population of protected or priority species, the Mayor will aim to secure compensatory measures to mitigate such effects.

The Mayor will take biodiversity issues into account in the consideration of planning referrals.

[www.london.gov.uk/mayor/strategies/biodiversity/](http://www.london.gov.uk/mayor/strategies/biodiversity/)

## Corporate responsibility

There is an increasing recognition that companies as well as the public sector have a responsibility to manage their impacts on biodiversity. This recognition is encompassed by the sustainability and corporate social responsibility agendas, which are fast becoming a primary business focus. Environmental protection and biodiversity objectives are seen as complementary to other targets such as employee satisfaction, stakeholder involvement and supplier relations as well as financial performance.

[www.businessandbiodiversity.org](http://www.businessandbiodiversity.org)  
[www.bitc.org.uk](http://www.bitc.org.uk)

### Decline in biodiversity: black redstart

With less than 100 pairs nesting in the UK and the single largest population occurring in London, there is an opportunity for planners and developers to assist in the conservation of the black redstart. The environment created by green roofs, for example, provides foraging habitat. These roofs not only provide habitat for this enigmatic bird but also for a myriad of invertebrates, including regionally and nationally rare species.

[www.blackredstarts.org.uk](http://www.blackredstarts.org.uk)

Photo credit: © Jim Duncan



Photo credits left to right:

© Mike Waite

4. Incorporating biodiversity into development:  
The five key steps

With a few simple key steps, developers can ensure that they comply with biodiversity legislation and achieve best practice. An overview of the process by which developers can achieve these objectives is presented below, with a graphical representation provided in Figure 2 (page 12).

1 Consultation and scoping study

A considerable amount of information already exists relating to the presence of important sites and species in London. Consultation with the appropriate statutory and non-statutory nature conservation organisations will ensure that historic data for a proposed development site is obtained. This should include obtaining those records available from the London Biological Recording Project (soon to become the London Biodiversity Records Centre).

Where no historic data exists for a site, or data is inadequate, it will be necessary for a trained ecologist to undertake a scoping study to identify ecological constraints and opportunities.

2 Detailed surveys and impact assessment

Where, through the scoping study, it has been recognised that a site does or could support species, habitat or features of biodiversity value, or has the potential for ecological enhancement, targeted and specific surveys should be undertaken to ensure accuracy and avoid potential dispute over results later in the development process.

The optimum survey season varies for different species. Table 2 opposite provides general guidance on appropriate survey seasons. This should be seen only as a guide for commissioning surveys and advice should be sought in order to ensure that surveys take place in the optimum season. Developers should also be aware that to gain adequate survey information, often more than one survey will be required for a particular species or group and that results can only be interpreted with reference to the timing of the work, the method employed, the conditions at the time of the survey, and the time spent in any investigation.

The potential impacts associated with a proposed development can be predicted following the collection of an appropriate level of baseline data. Figure 1 opposite indicates, in simple terms, some of the issues that will be considered when assessing potential impacts on features of biodiversity value.

Figure 1  
Features of impact assessment

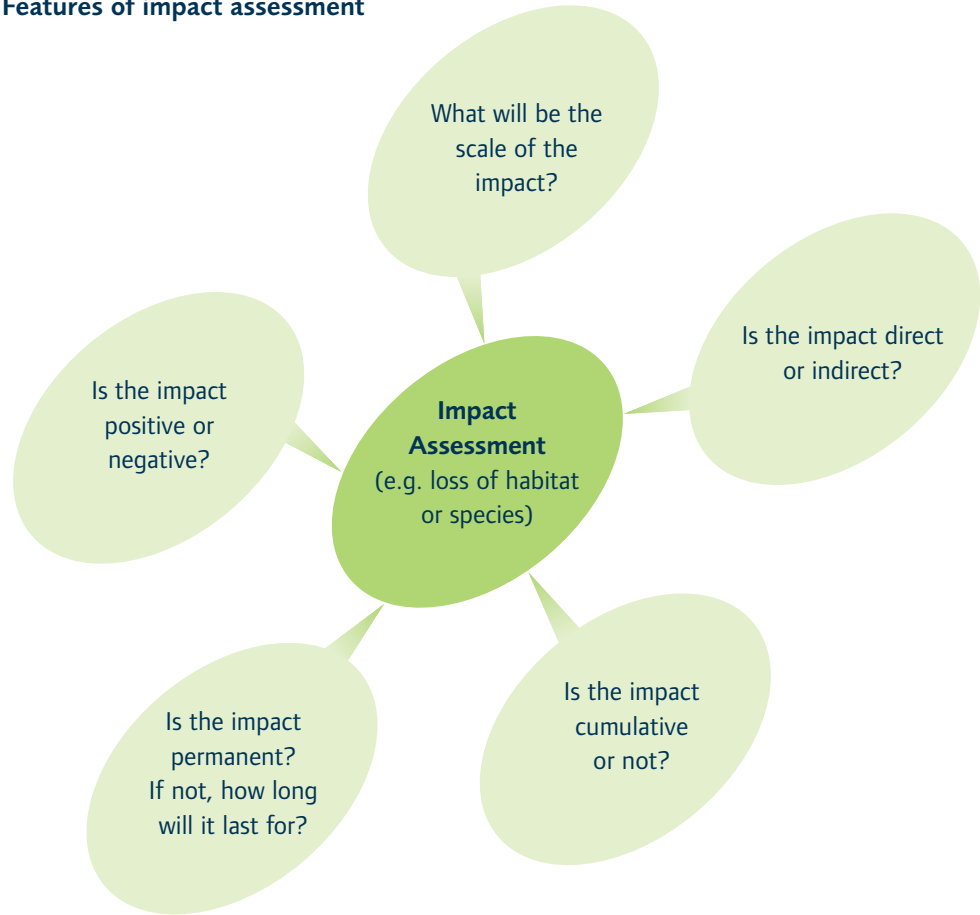


Table 2  
Guidance on appropriate survey seasons

Survey	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Scoping walkover	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal
Phase 1 habitat	sub-optimal	sub-optimal	sub-optimal	optimal	optimal	optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal
Botanical	sub-optimal	sub-optimal	sub-optimal	sub-optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal
Badgers	sub-optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal
Wintering birds	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	optimal	optimal
Breeding birds	sub-optimal	sub-optimal	optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal
Reptiles	sub-optimal	sub-optimal	sub-optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal
Amphibians	sub-optimal	sub-optimal	optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal
Invertebrates	sub-optimal	sub-optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal
Water voles	sub-optimal	sub-optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	optimal	optimal	sub-optimal	sub-optimal
Otters	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal	optimal
Bats	sub-optimal	sub-optimal	sub-optimal	sub-optimal	optimal	optimal	optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal

unsuitable time of year for surveyingsub-optimal time of year for surveyingoptimal time of year for surveying (best practice)



### 3 Design of development to incorporate biodiversity objectives

During the outline design stage, the nature conservation opportunities and constraints should be identified and worked into the masterplan for the development. Even where little biodiversity interest has been identified on a site, developers should aim to create features that will provide wildlife with opportunity to colonise. Biodiversity objectives should be drawn up, which are relevant and achievable within the development framework. These should be included within any outline planning applications, along with the baseline ecological information collected for the site, and the subsequent impact assessment. When the proposed development reaches the detailed design stage, there may be planning conditions relating to biodiversity, which need to be fulfilled. At this time detailed methodologies can be developed to fulfil biodiversity objectives. These should be incorporated into tenders for the construction contract, as necessary.

### 4 Enhancement, mitigation and compensation

When undertaking design, there is an order of priority to ensure best practice and the accommodation of biodiversity objectives

recommended by the Royal Town Planning Institute. First enhance, second avoid harm, third mitigate, and last, where there is no alternative, to compensate for biodiversity losses. This can be achieved through appropriate landscaping or by design of integral development features (e.g. flood protection or green roofs). Where retention and enhancement cannot be achieved, mitigation or compensation must be considered. This is illustrated in Table 3.

### 5 Management and aftercare

The management and aftercare of areas of nature conservation value that are to be retained, enhanced or created, is essential to ensure that they attain their full potential for both wildlife and people. This should ideally be achieved through the production of a Biodiversity Management Plan. Implementation of the Plan is likely to be a contractor's responsibility and should therefore be considered by developers at the tender evaluation stage.

On smaller sites, this Plan can be incorporated into the Landscape Plan. A trained ecologist should be engaged to ensure that the Plan contains adequate provision for appropriate monitoring, to track their success.

**Table 3**  
**Hierarchy for biodiversity mitigation**

Objective (in order of priority)	Discussion
1 Retain, enhance or create features of nature conservation value and avoid harm	The design of all developments should look to incorporate and enhance the features of existing nature conservation value on, or adjacent to, a site. This should not only aim to incorporate those features (or species) which are protected by statute or through land-use planning mechanisms but also those which contribute generally to the biodiversity of the area.
2 Mitigate for impacts to features of nature conservation value	Mitigation should be considered where it is impossible to avoid all impacts to a feature of value, and also where impacts can be lessened through a change in the design or operation of a development.
3 Compensation for the loss of features of nature conservation value	Where there is no viable alternative, there should be compensation for the loss of a feature of nature conservation value. When considering compensation for habitat loss, the aim should always be to replace 'like for like' or better.



### Decline in biodiversity : bats

At least eight of the 16 native bat species are known to be breeding in London (pipistrelle being the most common). Bat populations are declining nationally and in London repeat surveys since the 1980's have shown a significant decline in bat numbers. Key issues include the loss of suitable roosting habitat in trees and buildings, and loss of feeding areas. Developers can encourage bat populations by providing roost sites as part of the building or landscape design and by supplying

feeding areas as part of landscaping. Water bodies and night-scented plants attract insects for bats to feed. A good structure of vegetation, with some trees or shrubs, provides edges for bats to feed along.

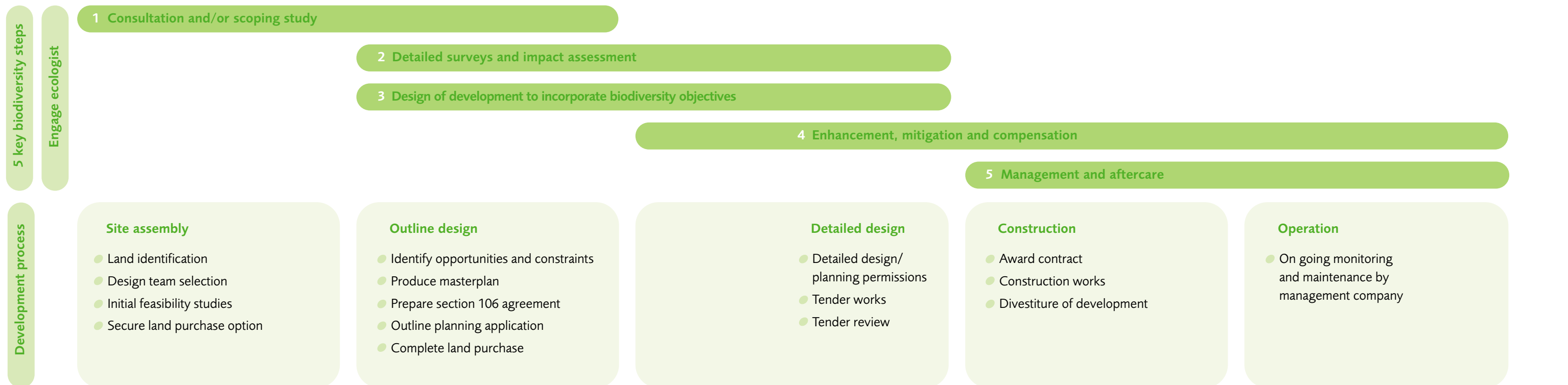
[www.londonbats.org.uk](http://www.londonbats.org.uk)

**Photo credit:**  
Courtesy of Bat Conservation Trust  
© Terry Whittaker





**Figure 2**  
Incorporating biodiversity into development:  
The five key steps





# 5. Creating areas of value for biodiversity and people: Issues and opportunities

Issues	Opportunities
Satisfying open space requirements	<ul style="list-style-type: none"> <li>There is often a requirement as part of a development to provide areas of open space, or community recreational facilities, or to provide enhancements to existing sites or facilities. A landscaping scheme that is sensitive to both the needs of the local people and of biodiversity will meet such requirements.</li> </ul>
Creating appropriate habitat for wildlife	<ul style="list-style-type: none"> <li>The existing vegetation, environment, soil and landscape should be considered. Wherever possible the starting point should be the existing vegetation, whether composed of native or non-native species.</li> <li>Where supplementation is needed, appropriate species of a local provenance may be used. In the special situation where the new habitat is to supplement an existing native habitat (such as an ancient wood) any landscaping should be with London native stock.</li> <li>In all cases the aim is to provide interest in colour and form, structural diversity, food (berries and nectar), nest sites, and shelter for wildlife. In landscaping, the use of horticultural varieties or artificial structures can still be beneficial in this regard.</li> <li>Where possible, it is better to leave nature to take its own course. This allows animals and plants to colonise naturally, ensuring that the landscaping fits in appropriately with the natural environment and requires minimal maintenance.</li> </ul>
Education and amenity	<ul style="list-style-type: none"> <li>The boundaries and corners of sports fields can provide space for landscaping with value for biodiversity.</li> <li>Greenspace in housing developments can be landscaped with a wildflower meadow crossed by shortly mown paths.</li> <li>The attractiveness of the landscaped areas in a development can be improved by planting native trees, using hedgerows for defining boundaries, and filling flower beds with nectar-rich plants.</li> <li>Where a development incorporates areas of value for nature conservation, interpretation facilities, such as information boards, will encourage learning about the local environment and indicate that the informality is intentional.</li> </ul> <p><a href="http://www.landlife.org.uk">www.landlife.org.uk</a></p>
Economic benefits	<ul style="list-style-type: none"> <li>Appropriate and attractive landscaping, offering workers and local residents an outdoor space to enjoy, and in which they can interact with nature, can be an excellent selling point for a development.</li> <li>Natural areas can be less expensive to manage than more formal landscaping.</li> </ul> <p><a href="http://www.seeda.co.uk/seeda_documents/docs/Building-for-Nature-winter-2002.pdf">www.seeda.co.uk/seeda_documents/docs/Building-for-Nature-winter-2002.pdf</a></p>



## Case Study

### Gillespie Park, Islington

#### Background

The site, a former British Rail goods yard, began operations in 1850 to bring coal to north London. This ceased in the 1960s and the site lay derelict until the 1980s when, following public consultation, the decision was taken to create a wildlife park. Islington Council took out a ten year lease and Gillespie Park was opened in April 1983. The park became well used by local people, including school children who were involved in its management. However, in 1996 British Rail announced that they were intending to sell the site so that it could be developed for residential use.

#### Incorporating development and biodiversity

A local campaign group was formed and Islington Council entered into lengthy negotiations with the landowner. Eventually an agreement was reached whereby 1.6 hectares of grassland and 0.4 hectares of existing allotment were made available for housing development in return for the lease of the remaining area of the park plus a further 1.2 hectares and an

excellent educational building. This was ratified by the granting of a section 106 agreement (Town & Country Planning Act, 1990). The park now covers an area of 2.8 hectares supporting a variety of habitats including neutral grassland, scrub, hedgerows, woodland and wetland. Some habitats have evolved naturally whereas others have been created by careful landscaping.

#### The benefits

The ecological centre is a heavily-used facility for both formal and informal education, providing a resource for a much larger area than that where the development occurred. The Council employs three people on site, including a Community and Educational Officer. Over 500 species of plant, 94 species of bird, 12 species of dragonfly and damselfly, and 24 species of butterfly have been recorded and, in 1996, the park was declared a Local Nature Reserve. It is also a Site of Metropolitan Importance for Nature Conservation.



# 6. Overcoming the loss of wildlife habitat: Issues and opportunities

Issues	Opportunities
Development causing the loss of habitat	<ul style="list-style-type: none"> <li>Although the first priority is always to avoid the loss of habitat, where a loss is unavoidable, developers should ensure provision of a similar or enhanced wildlife resource.</li> <li>Mitigation for the loss requires both a large total area and high quality of wildlife habitat in the replacement. Generally the translocation of species or habitats is unsuccessful, and this should be attempted only as a last resort.</li> <li>The re-use of the existing material on the site (soil or rubble) in a landscaping scheme should allow similar species to establish. This may reduce the disposal costs of such material for the developer. Seeds may be obtained from nearby areas of botanical value with similar site conditions and used for landscaping.</li> <li>Where there is no space for more natural settings, the establishment of green roofs or climbing plants offers developers the opportunity to incorporate limited wildlife habitats into a high density urban landscape. [Ref: 'Building Green'. Johnson, J. and Newton, J. Available from GLA Publications, Tel: 020 7983 4323]</li> </ul>
Development that fragments habitat	<ul style="list-style-type: none"> <li>Development can cause the break up of large areas of habitat into small unconnected habitat "fragments". These are often too small to support viable populations of certain plant and animal species.</li> <li>To help overcome this, developers should consider the retention of open space 'buffer zones' around the fragments, or 'stepping stones', or wide 'corridors' of habitat linking the fragments. The best stepping stones are large in area and of high quality wildlife habitat, but where this is not possible even individual trees or groups of trees, patches of grassland, climbing plants on walls, or a green roof, offer benefits.</li> </ul> <p><a href="http://construction.ntu.ac.uk/staffwebs/greenroofs/aboutGRandESB.htm">http://construction.ntu.ac.uk/staffwebs/greenroofs/aboutGRandESB.htm</a></p>
Disturbance during construction and operation	<ul style="list-style-type: none"> <li>Impacts can be reduced by timing construction activities appropriately to avoid impacts during sensitive times of the year e.g. bird breeding season.</li> <li>A briefing to all site personnel given by an ecologist can reduce the potential for accidental disturbance to features of value.</li> </ul>

## Case Study

### Deptford Creek

#### Background

In the mid 1990s, Deptford Creek consisted of a derelict warehouse, wharves, shipyards and a gasworks. Rubbish and debris had also been dumped on the site. Nevertheless, the site had excellent redevelopment potential, as well as significant biodiversity value. Surveys showed the site had developed its own distinct plant community associated with the dilapidated flood walls and adjacent to derelict land, which supported a variety of small animals. It was also prime habitat for a rare bird, the black redstart.

#### Incorporating development and biodiversity

In order to accommodate the wildlife interest of the derelict land any proposed development needed to be sympathetic. For example, there was an ideal opportunity to incorporate roof habitats and eco-friendly flood defences into the design, thus attempting to replicate the habitats that would be lost. The design of the 'green' roofs on buildings such as the Laban Centre and the Creekside Educational Trust, used a substrate of crushed brick and concrete graded from 50mm to dust, laid on a

flat or shallow surface. The roofs have a varied topography with shallow slopes and a diverse range of boulders, larger stones, and timber fenders that provide places for wind-blown and bird-sown seeds to germinate, and foraging habitat for black redstarts. New and refurbished flood walls have incorporated a variety of 'nooks and crannies' to speed up colonisation by plants and small animals.

#### The benefits

The habitats created afforded potential for similar plant and insect species to those found on the derelict land lost to the development. The developers have also benefited. The roofs slow the amount of rain water entering the drainage system, thereby reducing flash flood potential and, as the aggregate used in the construction of the roofs came from the site, disposal costs were saved. Also, from appropriate vantage points, the roofs and new flood wall add a splash of colour to the local highly-developed environment.

[www.blackredstarts.org.uk/pages/deptcreek.html](http://www.blackredstarts.org.uk/pages/deptcreek.html)



© Mathew Frith/English Nature



© James Farrell



## 7. Water: Issues and opportunities

### Issues

#### Providing flood protection

### Opportunities

- Developers may look to reinstate former floodplains as part of their development. Valuable wetland habitats can be maintained in areas where flooding occurs regularly.
- Where the construction of flood defences is unavoidable a sensitive approach to their design can be employed. For example, terracing can employ timber cladding and other materials providing places for wildlife to colonise. River banks can be 'stepped' to create a variety of wetland habitats.

[www.environment-agency.gov.uk/subjects/flood/](http://www.environment-agency.gov.uk/subjects/flood/)

#### Pollution

- There has been an ongoing improvement in the quality of rivers in the UK, not least in London, where water quality in the Thames has increased markedly in recent years.
- New developments can contribute positively to the quality of surface run-off through careful attention to design and through precautions during construction, for example by ensuring proper separation between foul sewer and surface water drains and rectifying previous misconnections.

#### Drainage

- Sustainable urban drainage systems (SUDS) can reduce the volume and slow the flow of water generated by a new development site. They provide more natural approaches to run-off management and help to prevent flooding and water pollution. They can be designed in a way that provides wildlife habitat. For example:
  - using permeable instead of hard surfaces;
  - installing grassed swales to convey surface water run-off; and
  - installing treatment basins, ponds and reedbeds that receive run-off from the development prior to discharge to a watercourse.

[www.sepa.org.uk/guidance/urban-drainage/](http://www.sepa.org.uk/guidance/urban-drainage/)

#### Culverting

- Historically, watercourses have tended to be culverted in concrete channels or pipes. Policies and guidance for developers now promote the de-culverting (opening up) of watercourses to produce environmental benefits.
- Rivers can be restored to more naturalised forms by de-culverting and providing space for tributary watercourses and wetlands within development designs.
- Embankments can be created that are set back from the river to allow wetlands to develop and also to create buffer strips.
- Natural vegetation can be used as a means of bank protection.

[www.sepa.org.uk/publications/leaflets/hei/](http://www.sepa.org.uk/publications/leaflets/hei/)



### Case Study

#### BICC Cables, Belvedere

##### Background

Since 1882 BICC (Pirelli) Cables Limited had operated on the same site in Belvedere, east London. During the 1990's need for further car parking areas increased and the site of a disused playing field was identified as a space that could be developed. Its former use meant the area prior to development consisted of only 2.3 hectares of grassland with a low nature conservation value. In order to prevent flooding and reduce the risk of pollution from car park surface run-off, the Environment Agency recommended the implementation of a sustainable urban drainage system (SUDS).

##### Incorporating development and biodiversity

A watercourse and a lagoon were constructed to retain run-off from the car park. In total, the area of open water measured 140 metres by 30 metres with the levels controlled by way of a pumping facility. Native wetland species including reeds, rushes and sedges were planted in and around the areas of

water with species-rich wildflower mixes used in the drier areas. Water passed through this vegetation and an oil separator before discharging to the adjacent dyke system. Finally, to ensure the newly created areas were managed in a way which would ensure they would reach their full biodiversity potential, a Biodiversity Management Plan was produced.

##### The benefits

The development secured an increasingly rare marshland habitat. The area was quickly colonised by amphibians, dragonflies and beetles, and its construction considerably increased the aesthetic value of the site. School children were encouraged to visit and educational facilities were provided. Employees of the company developed ownership of the site and willingly took on some of the management tasks.

[www.groundworks.org.uk/](http://www.groundworks.org.uk/)



## 8. Accessible communications statement

A summarised version of this document is also available in large print, braille, on disk, audio cassette and in the languages listed below.  
For a copy, please contact the LDA Communications Team:

London Development Agency  
Devon House  
58-60 St Katharine's Way  
London E1W 1JX

Tel 020 7954 4500  
email [communications@lda.gov.uk](mailto:communications@lda.gov.uk)

إذا أردت نسخة من هذه الوثيقة بلغتك، الرجاء الاتصال برقم الهاتف أو الكتابة الى العنوان أدناه:

আপনি যদি আপনার ভাষায় এই দলিলের প্রতিলিপি (কপি) চান, তা হলে নীচের ফোন নম্বরে বা ঠিকানায় অনুগ্রহ করে যোগাযোগ করুন।

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જો તમને આ દસ્તાવેજની નકલ તમારી ભાષામાં જોઈતી હોય તો, કૃપા કરી આપેલ નંબર ઉપર ફોન કરો અથવા નીચેના સરનામે સંપર્ક સાધો.

यदि आप इस दस्तावेज़ की प्रति अपनी भाषा में चाहते हैं, तो कृपया निम्नलिखित नम्बर पर फोन करें अथवा लिखे गये पता पर सम्पर्क करें।

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## For further information about these issues contact:



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English Nature is the Government agency that champions the conservation of wildlife and nature features throughout England.



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The London Development Agency is the Mayor's agency for business and jobs.

## MAYOR OF LONDON

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The Greater London Authority's Biodiversity Team provides strategic advice on wildlife sites, and incorporating biodiversity into developments.



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The London Biodiversity Partnership works together to implement action plans for London's priority habitats and species and involves London's communities in conservation.