

All of a Buzz in the Thames Gateway

**Planning for
invertebrate biodiversity**

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Summary

This document provides a resource for planners to enable proper application of the biodiversity considerations of Planning Policy Statement 9¹ to developments on brownfield sites within the Thames Gateway – with specific reference to invertebrates (insects, bugs, spiders, etc.).

The Thames Gateway holds nationally important populations of invertebrates, many of which are associated with brownfield. Almost 7,500 invertebrate species are known to have been recorded in the area – of these, 2,799 species are associated with brownfield habitats. 1,200 species of nature conservation importance have been recorded on brownfield, including a number of UK Biodiversity Action Plan² and Red Data Book species.

This document has been produced as part of the ‘All of a Buzz in the Thames Gateway’ project. This is a joint English Nature / Buglife project to gather the necessary information and evidence in order to develop a strategy for the management and conservation of the invertebrates closely associated with the area’s substantial brownfield habitats. The first phase of the project has now identified and mapped the extent of brownfield land in the Thames Gateway, and has produced a provisional assessment of its importance for supporting invertebrate populations.

Outputs of the project will include:

- A preliminary assessment of all brownfield sites in the Thames Gateway for their invertebrate quality
- ‘Alert maps’ for planners
- Invertebrate data from surveys carried out on selected ‘high priority’ brownfield sites
- A strategy for conserving this remarkable biodiversity asset, including the identification of ‘priority invertebrate conservation areas’ and ‘areas with potential enhancement opportunities’
- Tools for conserving the most important attributes of brownfield sites through appropriate management, habitat restoration and fresh approaches to landscaping and design of greenspaces in new developments
- Raised awareness of the ecological value of brownfield amongst both regeneration professionals and the general public.

The phenomenal rate at which development is progressing in the Thames Gateway, and our rapidly increasing knowledge of brownfield invertebrates and their conservation requirements, requires any relating information to be periodically updated in order to be useful. It is intended that updates to this information will be made available on the Buglife website³.

¹ Planning Policy Statement 9: Biodiversity and Geological Conservation

² The UK Biodiversity Action Plan specifies the conservation action required to conserve those species and habitats which the Government has identified as priorities

³ <http://www.buglife.org.uk>

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Preface: The ecological importance of brownfield habitats in the Thames Gateway for invertebrates

In the Thames Gateway brownfield sites support populations of many Red Data Book and Nationally Scarce invertebrate species (Plant & Harvey, 1997; Harvey, 2000), as well as a number included in the UK Biodiversity Action Plan (BAP), such as the Shrill Carder Bee, the Brown-banded Carder Bee and the ground beetle *Anisodactylus poeciloides*. Increasing recognition of the ecological importance of brownfield habitats has recently led to the proposal that a new BAP priority habitat be added – ‘Post-industrial sites of high nature conservation value’ – and a further 12 species closely associated with brownfield have been put forward for BAP priority species status.

In order to understand where all these species come from it is first necessary to appreciate why brownfield habitats can support such a high biodiversity. Brownfield sites have been dubbed ‘the new lowland heaths and flower-rich meadows’ (Jones, 2003), and on the best sites the habitats are often a complex mosaic of structurally diverse, flower-rich grasslands with bare ground, sparsely vegetated areas, lichen heath and ruderal vegetation. This is usually because they have developed on nutrient-poor and sometimes contaminated substrates, and are subject to sporadic disturbance. Other important habitats within the mosaic to be found on a number of Thames-side sites include: early successional and upper saltmarsh; seasonally wet (sometimes saline) habitats and; *Phragmites* (reed) areas. PFA (the waste from coal fired power stations) and sand extraction sites can provide habitats comparable to dune and soft rock cliffs. All these habitats may support very large and diverse invertebrate assemblages, vastly more so than the modern agricultural countryside and most urban greenspace.

Although sparsely vegetated ground and early successional habitats are key features, brownfield sites take time to develop important wildlife assemblages or contain areas that have been abandoned for many years. In the Thames Gateway, the dry climate and high summer sunshine levels mean that early successional habitats on poor substrates persist for long periods of time, even without management, with sites remaining open for as much as 50 years or more. This is an important issue: lack of mowing or cutting means that the forage resources, herbaceous stems, fruit heads, drought and mineral-stressed bramble that many invertebrate species depend on is left *in situ* from one year to the next.

Eventually of course, left alone, these habitats will become shaded out by scrub and gradually develop into secondary woodland, but this is equally true of most semi-natural habitats. The conservation value of priority habitats such as heathland, meadows, chalk grassland or the Breckland of East Anglia is not questioned, yet the wildlife importance of high-value brownfield land remains under considerable threat despite the ecological similarity with these important semi-natural habitats. Heathland, for example, is characterized by a range of dwarf shrub and/or acidic grassland vegetation occurring on dry, sandy, nutrient poor soils. This cultural landscape was created by forest clearance in Neolithic times and traditionally maintained as part of the working landscape by grazing, small-scale excavation of sands and gravels, turf and peat cutting and the gathering of gorse or furze for fuel. The nationally important region of chalk grassland on Salisbury Plain is also maintained by a combination of grazing, rotational cutting and disturbance

by military activity. The nutrient poor soils, low level grazing (e.g. by rabbits) and sporadic disturbance of these habitats are typical of what can be found on high quality brownfield sites.

Much of the remarkable invertebrate biodiversity to be found in the Thames Gateway can historically be considered to be a fauna of the former Thames Terrace grasslands – semi-natural, flower-rich open grasslands established over nutrient-poor gravelly soils – but today these invertebrate populations exhibit a strong association with the habitat mosaic that develops on poor, drought-stressed substrates such as found in many abandoned sand and chalk quarries, post-industrial land, silt lagoons and fuel ash lagoons. The Essex side of the Thames has a series of south-facing escarpments between Purfleet in the west and Southend to the east, with various exposures of chalk, Thanet sands, Thames terrace sands and gravels, and London clay. Similar exposures occur on the Kent side of the river. The Purfleet-Grays area of Essex has a long history of chalk extraction, with old leases dating back to the sixteenth century and modern times have seen much more extensive extraction of chalk and sand resulting in many abandoned exposures of different ages. It seems likely therefore that there is a very long history of ecological continuity of the rich invertebrate biodiversity of the Thames Gateway.

In structurally diverse and floristically rich sites that are isolated within a vast modern agricultural arable landscape the fauna may be unexpectedly poor, suggesting that isolation of populations is a key factor, at least for those less mobile invertebrates with the greatest nature conservation significance. Thus, the important invertebrate biodiversity interest in the Thames Gateway is now likely to be, dependent on the continuity of flower-rich structurally diverse relatively unmanaged habitats developed on various abandoned post-industrial substrates on the edges of major conurbations, i.e the habitats found on brownfield sites. The danger now is that the large scale redevelopment of the brownfield resource will rapidly reduce and isolate good quality habitat and populations of many species will become extinct.

1. Planning for invertebrate biodiversity

1.1 Planning Policy Statement 9: Biodiversity and Geological Conservation

PPS9 provides the definitive Government guidance on the role of local planning authorities in the conservation of biodiversity. This PPS is significantly different from the former PPG9. Notably PPS9 promotes a proactive role for local planning authorities in the conservation of biodiversity. Not only are local planning authorities required to conserve biodiversity through site protection policies, they are also expected to conserve and enhance biodiversity by basing decisions on up-to-date information and evidence and enhance biodiversity by influencing the design and form of development. Furthermore local planning authorities are encouraged to secure the conservation of UK Biodiversity Action Plan species through policies that conserve their habitat outside of the designated sites network. The recommendations below provide a commentary on the pertinent parts of PPS9 in relation to invertebrate conservation on brownfield sites.

1.2 Site protection

PPS9 para 9: *Sites of regional and local biodiversity and geological interest, which include ...Local Sites, have a fundamental role to play in meeting overall national biodiversity targets....Criteria-based policies should be established in local development documents against which proposals for any development on, or affecting, such sites will be judged.*

There needs to be adequate protection for brownfield sites that are deemed to be important on a national and local scale for their invertebrate species and assemblages. The designation of Canvey Wick⁴ as a legally protected Site of Special Scientific Interest (SSSI) in 2005 has provided a much-needed benchmark in this respect. However there are other sites of significant value which have not yet received protection. The challenge is to ensure that the most important sites for invertebrates – brownfield or otherwise – are properly identified and protected through local authority planning policy or, if appropriate, statutory designation.

Sites identified in this document (in Appendices 1 & 2) shown as having medium or high potential for invertebrates may be of national or county/metropolitan interest for nature conservation. In line with national planning policy guidance local authorities should seek to conserve the potential nature conservation interest of these sites and identify them as Local Sites of nature conservation interest (aka Wildlife Sites or Sites of Importance for Nature Conservation) in Local Development Documents, if they meet agreed criteria.

1.3 The importance of site evaluation and surveys

PPS9 para 1 (i): *Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics*

⁴ Details of the site can be found at www.english-nature.org.uk/special/sssi/sssi_details.cfm?sssi_id=2000497

should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

PPS9 para 16: *Other species have been identified as requiring conservation action as species of principal importance for the conservation of biodiversity in England. Local authorities should take measures to protect the habitats of these species from further decline through policies in local development documents. Planning authorities should ensure that these species are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations.*

The inadequacy of many environmental assessments is undoubtedly a major contributing factor to the loss of brownfield sites of nature conservation value. Invertebrates are one of the key groups on brownfield, but it is only in recent years that the ecology of these sites has been recognised. Many of the most important species occur on sites which are not part of the designated sites network; therefore the provision of site-specific information to planners is necessary in order to fulfil the requirement to conserve and enhance biodiversity.

Development proposals on sites identified in Appendix 1 & 2 as being of medium or high potential for invertebrates should be accompanied by appropriate invertebrate survey. The survey should be carried out by an experienced entomologist familiar with the ecology of previously developed sites, and should concentrate on the key invertebrate groups and UK BAP priority species identified in Section 2 of this report.

The full results of surveys should be presented with the development proposals, and should indicate:

- The site's invertebrate interest, and its local, regional and national significance.
- Any habitats and features of importance for invertebrates.
- How the development will retain and enhance any habitats and features of importance for invertebrates.
- How any negative impacts upon invertebrates will be avoided, mitigated and/or compensated through the design of development and through on-site and/or off-site work.
- How new or retained habitats and other features will be managed in the long-term to maintain and enhance their invertebrate interest.

For information on best practice for invertebrate site surveys English Nature have produced a booklet: *Organising surveys to determine site quality for invertebrates*. This can be downloaded at www.english-nature.org.uk/pubs/publication/PDF/InvertsSurveyR.pdf

1.4 Habitat protection and creation within new developments

PPS9 para 13: *The re-use of previously developed land for new development makes a major contribution to sustainable development by reducing the amount of countryside and undeveloped land that needs to be used. However, where such sites have significant biodiversity or geological interest of recognised local importance, local planning authorities, together with developers, should aim to retain this interest or incorporate it into any development of the site.*

PPS9 para 14: *Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, local planning authorities should maximise such opportunities in and around developments, using planning obligations where appropriate.*

Brownfield sites in the Thames Gateway are being developed at a rapid rate, and many valuable invertebrate habitats have already been lost. Although there are legal requirements to carry out environmental assessments and present the findings with planning applications, it is likely that most developers, planners, civil engineers and landscape architects have little or no knowledge of how to mitigate the loss of these habitats.

Where a site is the subject of a development brief, its importance, or potential importance, for invertebrates should be identified. There should be a requirement for appropriate site survey in order to identify, confirm or dismiss the site's invertebrate interest. Surveys would identify the extent and distribution of habitats or features of importance for invertebrates, and inform any proposed mitigation, compensation and/or positive nature conservation measures. Where any negative impacts on important invertebrate populations cannot be fully mitigated on site, there may be a requirement for off-site mitigation or compensation.

Wherever possible, development should be designed to retain and incorporate habitats and other features of importance for invertebrates that are identified during assessments and surveys. Furthermore, the design of new development should realise opportunities to create new habitats and features of value to invertebrates. Depending on local circumstances this might include:

- Creating areas of open, flower-rich grassland.
- Creating other important habitats or features such as scattered scrub or wetland habitats, through an informed approach to landscape design.
- Maintaining open, sunny conditions by avoiding extensive or dense tree planting.
- Incorporating appropriately designed green or living roofs.

Information and toolkits about how to protect and create the habitats on which invertebrates depend can be found in Section 3.

2. Key invertebrate species and groups

Almost 7,500 invertebrate species are known to have been recorded in the Thames Gateway⁵. Nearly half of these species (3,376) are of nature conservation importance. Of the total number of species recorded, 2,799 species are associated with brownfield habitats. Over a third of the species of nature conservation importance (1,198) have been recorded on brownfield. These statistics are further evidence of the national significance of the Gateway's invertebrate populations, and of the large number of rare species associated with brownfield habitats.

A number of UK Biodiversity Action Plan (BAP) invertebrate species associated with brownfield sites are known to occur in the area. These include:

Brown-banded carder bee, *Bombus humilis*

Shrill carder bee, *Bombus sylvarum*

Weevil wasps *Cerceris quinquefasciata* and *C. quadricincta*

A ground beetle, *Anisodactylus poeciloides*

Phoenix fly, *Dorycera graminum*

Hornet Robberfly, *Asilus crabroniformis*

This list will grow if potential BAP species (of which 12 have been recorded on brownfield sites in the area to date) are upgraded to full BAP status, and new records are added.

The habitat features that characterise many brownfield sites, such as flower-rich areas and bare ground, are more beneficial to some groups of insects than others. As reflected in the BAP species above, the groups with the best representation on brownfield sites, and thus possible targets for survey, are:

Hymenoptera – ants, bees and wasps

Coleoptera – beetles

Diptera – true flies

Spiders are also well represented on brownfield sites, and can also be a good indicator of habitat quality.

⁵ This figure is based on records collated by the 'All of a Buzz' project in 2005.

3. Useful resources

Natural Regeneration – biodiversity conservation in the Thames Gateway

www.kentwildlife.org.uk/pdfs/Natural_Regeneration.pdf

Design for Biodiversity

www.london.gov.uk/mayor/strategies/biodiversity/docs/design_for_biodiversity.pdf

Biodiversity by Design www.tcpa.org.uk/biodiversitybydesign.htm

Living Roofs www.livingroofs.org/

Landlife www.landlife.org.uk/

Integrating Biodiversity into Development www.wildlifeandplanningessex.org.uk/

Organising surveys to determine site quality for invertebrates.

www.english-nature.org.uk/pubs/publication/PDF/InvertsSurveyR.pdf

Further reading

Harvey, P.R. (2000) The East Thames Corridor: a nationally important invertebrate fauna under threat. *British Wildlife* **12** (2): 91-98.

Jones, R.A. (2003) The 2001 Presidential Address – Part 2. A celebration of urban entomology. *British Journal of Entomology and Natural History* **16** (2): 109-121

Plant, C. W & Harvey, P. 1997. *Biodiversity Action Plan. Invertebrates of the South Essex Thames Terrace Gravels - Phase 1: Characterisation of the existing resource*. Report number BS/055/96 for English Nature, Colchester.