

All of a Buzz in the Thames Gateway

Phase 1: Identification of the brownfield resource and preliminary assessment of the invertebrate interest

Produced for Buglife – The Invertebrate Conservation Trust by

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Summary

This report outlines the activities undertaken during Phase 1 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. This study has now identified the extent of brownfield land in the Thames Gateway, and has produced a provisional assessment of its importance for supporting invertebrate populations. It has also developed a database of brownfield sites with information about the invertebrate conservation interest of individual sites. This information can be accessed at [TBC]

According to official figures the Thames Gateway² contains the greatest concentration of brownfield land in the South-East – almost 4,000 hectares³. After a desk study was undertaken to identify the actual numbers and locations of brownfield sites, it emerged that the actual figure was significantly higher than the official estimate, at nearly 5,500 hectares of land⁴. The main source of brownfield site information was the National Land Use Database of Previously Developed Land (NLUD), plus aerial photography and the knowledge of individual entomologists. The project now has a comprehensive database of 520 brownfield sites in the Thames Gateway, although in some instances there is a need to verify their current status (ownership, threats etc).

During autumn 2005 an assessment of the likely invertebrate importance of these sites was undertaken by two entomologists with recognised expertise in the field of brownfield habitats and species. A large sample of sites was selected according to geographical area, size, land use and other factors, and a bespoke brownfield habitat assessment form was developed to enable the collection of objective and comparable site data. Almost 180 sites – over 40% of the resource – were assessed during the study. The assessors, drawing on their previous experience and knowledge of the region’s brownfield sites, were able to evaluate each site as being of either High, Medium or Low importance for invertebrates. Over 70 sites – 40% of the sites assessed – were estimated to be of ‘High’ quality for invertebrates.

Existing invertebrate records from the project area were also identified and collated; where possible these were matched to known brownfield sites. The study has so far collated over 300,000 invertebrate records for the Thames Gateway, and identified many more. Almost 7,500 individual species have been recorded in the area, and nearly half of these species (3,376) are of nature conservation importance; over a third have a national status of Notable/Scarce or better. Of the total number of species recorded, 2,799 species are associated with brownfield habitats in the Thames Gateway. Over a third of the species of nature conservation importance (1,198) have been recorded on brownfield. These statistics are

² The Thames Gateway is the largest of the Government’s four Growth Areas, and aims to deliver economic and social regeneration in an area which extends for 40 miles along the River Thames, from the London Docklands to Southend in Essex and Sheerness in Kent.

³ ODPM website: http://www.odpm.gov.uk/index.asp?id=1140191#P11_151 Note: the ODPM has now been replaced by the Department for Communities and Local Government.

⁴ The discrepancy between figures is likely to be attributable to varying definitions of ‘brownfield’ and different mapping techniques.

further evidence of the national significance of the Gateway's invertebrate populations, and of the large number of rare species associated with brownfield habitats.

The data collected by the study will make a significant contribution towards a fuller evaluation and understanding of the Thames Gateway's terrestrial invertebrate resource. This is an urgent priority, given that the project has highlighted the speed with which brownfield sites are being developed, and the likely negative impacts of this upon the region's rich invertebrate biodiversity if unmitigated.

The next phase of the project will:

- Complete the preliminary assessment of all brownfield sites in the Thames Gateway
- Undertake more extensive invertebrate surveys on selected 'high priority' brownfield sites
- Develop a strategy for conserving this remarkable biodiversity asset, including the identification of 'priority invertebrate conservation areas' and 'areas with potential enhancement opportunities'
- Identify methods 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
- Deliver a programme of awareness-raising aimed at both regeneration professionals and the general public.

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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, such as the Shrill Carder Bee, the Brown-banded Carder Bee, the picture winged fly *Dorycera graminum*, the solitary wasps *Cerceris quinquefasciata* and *C. quadricincta* 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, structurally diverse and with very flower-rich grasslands as well as 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* areas. PFA 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 many semi-natural habitats. In fact they have much more in common with the historic wildlife-rich countryside than the intensively farmed modern version. 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 so valued by all conservationists and naturalists. No one questions the importance of ‘semi-natural’ priority habitats such as lowland heathland, lowland meadows, lowland calcareous grassland or the Breckland of East Anglia and yet the wildlife importance of high-value brownfield land remains under considerable threat despite the ecological similarity with these important semi-natural habitats. Lowland heath 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 lowland calcareous 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 frequently 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. The biodiversity associated with brownfield land in the Thames Gateway and other comparable regions elsewhere is likely to be a combination of the survival of metapopulations at a landscape scale, dependent on a continuity of flower-rich structurally diverse relatively unmanaged habitats developed on various abandoned post-industrial substrates on the edges of major conurbations, with an ability by these species to move into suitable habitats as they develop. The danger now is that the new large scale redevelopment of the brownfield resource will rapidly reduce and isolate good quality habitat and populations of many species will become extinct.

1. Introduction

1.1 Background

1.1.1 Aims of the study

The Thames Gateway is known to support an important invertebrate resource, including populations of at least eight UK Biodiversity Action Plan (UK BAP) priority species, including the Brown banded carder bee *Bombus humilis*, the Hornet Robber Fly *Asilus crabroniformis* and the ground beetle *Anisodactylus poeciloides*. However, the area has been identified as Europe's largest regeneration area and will be subject to major development over the next 10-20 years. The Government has acknowledged the environmental importance of the Thames Gateway and in *Greening the Gateway: a greenspace strategy for the Thames Gateway* has set out an approach that aims to integrate regeneration and environmental protection.

The nature conservation sector requires evidence, information and advice in order to conserve the important invertebrate assemblages present within the Thames Gateway through influencing the regeneration and greenspace agendas. Equally, the regeneration sector requires information to help plan and implement development in ways which are sympathetic to invertebrate conservation.

The main aims of this study are:

- To collate a database of terrestrial invertebrate records within the Thames Gateway project area and produce an accompanying spatial distribution map.
- To evaluate the known terrestrial invertebrate resource within the project area in terms of local/regional/national importance, with particular reference to species associated with 'brownfields' and similar habitats.
- To identify the key invertebrate assemblages and species within the project area, with particular reference to 'brownfield' habitats.
- To list all of the known BAP invertebrate species, and other notable Red Data Book (RDB) species, that are represented in regionally significant populations within the project area.
- To list all sites identified that would fit the broad category of 'brownfield' (i.e. previously developed land, quarries, landfill sites, road cuttings etc.) within the project area, and to assess each one to indicate the likely invertebrate assemblages to be found, and provide an indication of the likely abundance / significance of the invertebrate resource.
- To evaluate the relative importance of different land uses for providing supporting habitats for key invertebrate groups with the aim of identifying 'priority invertebrate conservation areas' and 'areas with potential enhancement opportunities' within the Thames Gateway corridor.

- To make recommendations for action to support the conservation of the invertebrate resource within the Thames Gateway.

1.1.2 Geographical area of study

The study area for the project is the Thames Gateway – the largest of the government’s four growth areas – which extends for 40 miles along the River Thames, from the London Docklands to Southend in Essex and Sheerness in Kent. The Gateway incorporates east London, south Essex and north Kent, and includes the following Local Authorities:

- **Kent:** Dartford, Gravesham, Medway (UA), Swale
- **Essex:** Thurrock (UA), Basildon, Castle Point, Southend-on-Sea (UA)
- **London Boroughs:** Havering, Barking & Dagenham, Newham, Tower Hamlets, Lewisham, Greenwich, Bexley.

The Gateway contains 80,600 hectares of land. Government figures estimate that 4,000 hectares of this is brownfield land – almost a fifth of the total brownfield found in the South-East.

1.1.3 Threats to the brownfield resource

The aim of the Government’s Thames Gateway initiative is to deliver regeneration and economic development in the East Thames Corridor, which is viewed as a region of derelict, vacant and under used land. Even before this the old quarries and sand pits of Thurrock and north Kent had long been viewed as derelict wastelands, an eyesore and blight on the area. This has been a key driver for extensive housing and retail developments like ‘Chafford Hundred’, ‘Lakeside’ and ‘Bluewater’ and the more recent pressures to regenerate the region.

A number of nationally important invertebrate habitats have been lost to development in recent years. Despite its recognised national importance Mill Wood Pit in Thurrock was lost to housing. Parts of Barking Levels, a site identified as being of ‘High’ quality for invertebrates in this report, have already been developed for housing. Valuable habitat at Ferry Fields which supported populations of two Biodiversity Action Plan priority species (the Hornet Robber Fly and the Shrill Carder Bee) has also been lost.

Habitats are threatened not only by direct loss of land to development, but also to associated landscaping schemes which are unsympathetic or uninformed by the local ecology and the desire to generate tidy amenity landscapes perceived by developers, landscape architects and planners to be what the public want. The value of the flower-rich structurally diverse open habitats that these landscapes often replace is not recognised. Great efforts are put into retaining mature trees in developments, and in planting hundreds or thousands of new trees, but this often serves to complete the destruction of structurally diverse open habitats. Tree-planting is not a nature conservation panacea. This tree-dominated mentality is repeated on roadside verges.

There is increasing evidence that important brownfield sites extend from the Thames Gateway into the Lee Valley (e.g. Harvey, 1999; Harvey, 2004; Hansen, 2005) and around Colchester, where Thames Terrace substrates and a very similar climate has produced comparable brownfield habitats to those found in the Thames corridor. Both areas are also highly threatened by development pressures, and many sites of probable importance have already been lost.

1.2 Definitions

1.2.1 Brownfield site

The following definition of ‘previously developed land’ or brownfield developed by the National Brownfield Sites Project (2000) was taken as a starting point:

“A brownfield site is any land or premises which has been previously used or developed and is not currently fully in use, although it may be partially occupied or utilised. It may also be vacant, derelict or contaminated.”

However for the purposes of this study a more exact definition of brownfield land was required, to identify the specific types of land which should be included. This expanded definition includes:

“Previously developed or post-industrial land, quarries and extraction pits (both aggregate and non-aggregate), landfill sites, road cuttings, railway cuttings and sidings (including disused lines), disused canals, brown and green roofs, underground (covered) reservoirs, disused sewage works, disused harbours and wharves, spoil (including fly-ash and dredgings), military sites, ex-built sites and derelict buildings with a minimum size of 0.25 hectares.”

The following were excluded from the scope of the study: urban gardens and allotments, parks (unless they incorporate previously developed land), amenity grassland, churchyards and cemeteries.

1.2.2 Invertebrates of conservation importance

The phrase ‘invertebrates of conservation importance’ used within this report is taken to include those species which are protected by statute; recognised as of conservation importance within the UK Biodiversity Action Plan (UK Biodiversity Steering Group 1999); or listed as Nationally Scarce or Red Data Book species in the various published reviews.

A list of invertebrates of conservation importance associated with brownfield habitats in the Thames Gateway is provided in Appendix 2.

2. Results

2.1 Brownfield sites in the Thames Gateway

2.1.1 Extent of the brownfield resource

The study has identified a total of 520 brownfield sites in the Thames Gateway, covering 5,482 hectares. The number of sites found in each area is as follows:

Kent – 207 sites⁵
London – 177 sites
Essex – 136 sites

This figure cannot be considered definitive and should be treated with a measure of caution, as brownfield sites are developed and – to a lesser extent – created on a continuous basis.

A list of brownfield sites can be found in Appendix 1 of this report.

2.1.2 The value of the brownfield resource for invertebrate conservation

During the study habitat assessments were carried out on 175 brownfield sites in the Thames Gateway. 155 sites were assessed by a direct site visit. Each entomologist had to take into account factors such as the survey time of year, which often made it impossible to identify all vegetation types present or likely to be present, before using their knowledge and experience of other brownfield habitats to reach a subjective assessment of the potential invertebrate species diversity of the site. The remaining 20 sites were assessed according to the prior knowledge of the project entomologists.

Below is a summary of estimated quality ratings for all brownfield sites assessed, both individually for London, Essex and Kent and as an overall figure. 41% of sites assessed were estimated to be of ‘High’ quality for invertebrates. Over 60% of assessed sites were estimated to be of ‘Medium’ quality or better.

		Estimated site quality		
		High	Medium	Low
Area	London	18	20	29
	Essex	29	8	18
	Kent	24	11	18
Totals		71	39	65

A full list of brownfield sites and their quality assessments can be found in the database of brownfield sites. This database can be accessed at [TBC]

⁵ The higher number of sites for Kent reflects the fact that more information, such as aerial photography and habitat data, was available.

2.1.3 Distribution maps

The data collected by the study has been inputted into a database and used to create maps showing:

- the distribution of brownfield sites in the Thames Gateway, with a provisional assessment of their quality for invertebrates⁶
- species density for the Thames Gateway by tetrad
- species density linked to built-up areas.

Maps can be found in Appendix 8 of this report.

2.2 Invertebrates associated with brownfield sites in the Thames Gateway

2.2.1 Invertebrates of conservation importance

The records collated for this study have provisionally identified at least 3,376 invertebrates of conservation importance across all habitats in the Thames Gateway. 1,237 have a national status of Notable/Scarce or better, and an additional 58 are included in the Essex or Kent Red Data lists. A further nine are new to Britain. Data provided by two recorders – Peter Harvey and D.A. Smith – indicates that of this overall figure some 2,799 species are associated with brownfield habitats⁷. This includes 1,198 species with the following conservation designations:

New to Britain	6
RDB	90
NA	60
NB	166
N	81
LOCAL	795
UKBAP	7
pUKBAP	12
Extra Essex Red Data spp.	22

These provisional data reveal that a significant proportion of the rare and threatened invertebrates in the Thames Gateway – possibly over a third – are associated with brownfield habitats.

2.2.2 All invertebrate species

This study has collated records for 7,435 invertebrate species recorded in the Thames Gateway. Comparing the total recorded species numbers of the Thames Gateway with other biodiversity-rich hotspots helps illustrate the importance of the area. In the Breckland Natural Area in East Anglia – an area which is nationally important for the conservation of a wide

⁶ During this study 175 sites were assessed in total.

⁷ Essex County Data for the region and results of their own survey work.

range of invertebrates and contains a comparable amount of semi-natural habitat⁸ – there are 1,765 species of beetle recorded and 302 aculeate Hymenoptera. The provisional list for the Thames Gateway region (which does not yet include records from a number of national recorders, including Peter Hammond, the Essex Coleoptera Recorder) contains 1,660 beetles and 440 aculeate Hymenoptera.⁹

Given the dissipation of species records, owing to the large number of data holding individuals and organisations, it is reasonable to expect that this number would rise significantly if – subject to time and resource constraints – a concerted effort were made to locate additional data.

⁸ The extent of heathland in the Brecks has been estimated at 4,757 ha (figure taken from Norfolk Biodiversity website http://www.norfolkbiodiversity.org/actionplans/habitat/lowland_heathland.asp).

⁹ Harvey, P.R. (2004). The invertebrates of Red Lodge Heath in relation to other sites in the Breckland Natural Area: aculeate Hymenoptera and Coleoptera. Report for English Nature.

3. Other activities

3.1 Phase 2 project development

An important element of this first phase has been to develop the next phase of the ‘All of a Buzz in the Thames Gateway’ project. This has included identifying potential partners and stakeholders, and approaching potential funders. The activities outlined below summarise the progress that has been made towards these objectives.

3.1.1 Funding

The **Countdown 2010 Biodiversity Action Fund** has recently announced that it will be contributing substantial funding to the project for the next two years, supporting the employment of two project staff, awareness-raising activities including leaflets, publications and public events, and the development of a strategy to conserve the brownfield biodiversity resource in the Thames Gateway.

Bridge House Trust has agreed to provide funding towards a brownfield project officer for the next two years. This funding will cover the London-based elements of the project, including invertebrate surveys of brownfield habitats, producing leaflets and other outreach material, and organising public events.

Other potential funders have been approached, including the **East of England Development Agency (EEDA)**, **Cleanaway Pitsea Marshes Trust** and the **Heritage Lottery Fund**.

Contacts have also been made with several of the borough biodiversity officers, with a view to their supporting local survey work, as well as potential joint activities.

3.1.2 Partners and stakeholders

In addition to the existing organisations involved in ‘All of a Buzz’, it is clearly important that the project involves as wide a spectrum of Thames Gateway stakeholders as possible. In addition to the nature conservation sector, the project needs to engage planners, developers, landowners, site managers and the general public. A large number of meetings have taken place in order to identify and approach potential partners and stakeholders for the next phase of the project. Meetings have taken place with the following:

- **Design for Biodiversity and livingroofs.org**
Brown roofs are one of the possible tools for on-site development mitigation. Several meetings took place with Adam Ingleby (Design for Biodiversity) and Dusty Gedge (livingroofs.org). A number of brown roofs were visited in the London area, to see their potential for recreating brownfield habitat for invertebrates. Buglife and livingroofs.org have now received funding for a project to construct a high profile green roof for biodiversity in the Thames Gateway.
- **Land Regeneration Trust**
Contact was made with David Beuzeval of the Land Regeneration Trust. The Trust is currently funding a project to explore the long-term restoration and management

of former landfill sites, and it is hoped that this will deliver favourable outcomes for brownfield invertebrates. A meeting of stakeholders is due to take place in 2006.

- **East of England Development Authority**
Paul Hinds (EEDA Environment Manager) was briefed on the project and was sent a copy of the proposal. Given EEDA's involvement in the Canvey Wick SSSI brownfield site, there was interest in providing support to the project.
- **Developers**
Contact has been made with the developers of two significant brownfield sites, in Purfleet and Dartford. Both sites have been identified as holding nationally important populations of invertebrates, including a number of BAP species. In both cases the developers were committed to some form of mitigation, but lacked guidance on how this was to be achieved.
- **Ecologists**
In addition to the entomologists closely involved in the project, contact has been made with a number of ecological consultants involved in brownfield site developments.
- **Greening the Gateway**
A meeting took place with Jane Houghton of the Countryside Agency, to explore ways in which the 'All of a Buzz' project could work within the greenspace agenda.
- **Local authorities**
Contact has been made with the Essex County Council planning department. Feedback was provided on the draft Essex Design Guide.
- **London Biodiversity Partnership**
Buglife has joined the partnership and looks forward to promoting brownfield issues to other member organisations.
- **Npower**
A meeting took place to explore the possibility of installing a brown roof on the Energy and Environment Centre at Tilbury power station – this project has now received funding and is due to commence in June 2006. Also arranged for the survey of an adjoining brownfield site next year, accompanied by a couple of public events (all of which will be funded by Npower).
- **Other nature conservation NGOs**
Discussions have taken place regarding the possibilities for improving the management of existing RSPB and Wildlife Trust reserves for their invertebrate populations. This could help to provide mitigation for the widespread loss of brownfield sites within the Thames Gateway. A specific site at Aveyley Marshes was identified as possible location for an innovative chalk grassland habitat creation scheme. Buglife has also been invited to provide advice on a habitat creation scheme at Mucking Flats in Essex.

- **Thames Estuary Partnership**
Contact was made with Jonathan Ducker to discuss possible initiatives, including providing technical support to the draft riverside guidance.

3.2 Project dissemination

Promotional activities for this phase of the project have been deliberately muted, given that the main outputs of 'All of a Buzz' will only emerge during the next phase. However the project was promoted in a number of ways, both through the meetings that took place (see above) and some more specific activities. Additionally, a press release is planned to coincide with the completion of phase 1 and commencement of phase 2 in mid-2006.

Kent Wildlife Conference

A presentation on brownfield sites and the 'All of a Buzz' project to an audience of 200 Kent naturalists. A number of useful contacts were made.

Thames Gateway Forum

This high profile event provided an ideal opportunity to promote the project to professionals involved in the regeneration of the Thames Gateway.

Buglife website

Details of the project are available online at www.buglife.org.uk

KMBRC newsletter

The December 2005 issue featured the project <http://www.kmbrc.org.uk/December05.pdf>

Buglife Annual General Meeting

The theme of the spring AGM of the charity was 'The importance of urban habitats for invertebrates'. Held at Camley Street Nature Reserve in London, speakers included Dusty Gedge, Peter Harvey and Jamie Roberts.

Berkshire Recorders Conference

A presentation on brownfield sites and the 'All of a Buzz' project to an audience of 60 Berkshire naturalists.

4. Recommendations

4.1 The importance of site evaluation and surveys

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 attracted interest, both within the recording community and beyond. It is clear that planners, developers and ecological consultants now require technical guidance on how to assess the ecological quality of sites – particularly their invertebrate interest.

Although the habitat assessment form developed by this project has proved extremely useful in providing an indicative measure of a site's quality for invertebrates, this in no way negates the need for a full and comprehensive entomological survey to be carried out at the correct time of year. It is hoped that the habitat assessment form will provide a platform upon which to develop a standard methodology for site-specific assessment, an urgent priority for brownfield. The form could also be adapted for public use, and made available online. This would facilitate a substantial increase in the collation of information about brownfield sites and their ecological value. It would also have the added benefits of increasing community engagement in local wildlife sites, as well as promoting the 'All of a Buzz' project, brownfields in general and invertebrate conservation.

The form is provided in Appendix 4 with guidance on its use and applicability in Appendix 5.

4.2 Habitat creation within new development

Brownfield sites in the Thames Gateway are being developed at a rapid rate, and many valuable invertebrate habitats have been lost in the last five years. 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.

During this study, it was found that many of the brownfield sites earmarked for development had in fact already been built on. Although details of each environmental impact assessment are not known, many of the resulting housing, retail or industrial estates display little or no mitigation for the invertebrate habitat lost. The only obvious attempt at some form of ecological recompense on most development sites was tree-planting. Unfortunately tree-planting can further damage the bare ground habitats required by the invertebrate populations. The nature conservation interest of semi-natural habitats such as chalk downlands, lowland heaths and duneslacks, which are maintained by grazing and/or the low nutrient status of the substrate, are degraded by becoming scrubbed over and eventually wooded. Tree-planting in these places would be regarded as ecologically inappropriate. There is clearly a need to emphasize the similarly negative impact which trees have upon brownfield habitats.

It should be acknowledged that at present there is a dearth of recognised alternatives to this generic landscaping and habitat creation. Developers and landscape architects, when constrained to integrate brownfield habitat types into their designs, have few sources of information and guidance to turn to. As the case studies in Appendix 7 of this report

demonstrate, there is little existing best practice for creating and managing brownfield habitats within developments.

There is clearly a pressing need for more examples of habitat creation, including developments which incorporate green/brown roofs, green walls and other features designed specifically for brownfield invertebrates. Developers should be encouraged to retain and manage existing areas of semi-natural vegetation and other key brownfield features within new developments.

Former aggregate extraction sites also provide a valuable opportunity to create brownfield habitats. There is a need to work with aggregate extraction companies and planners to ensure that the after-use and/or restoration of sites incorporates well-informed and effective habitat creation schemes for invertebrates, so that these sites can make a significant contribution to nature conservation.

Phase 2 of the ‘All of a buzz’ project will promote good practice, through collating and disseminating information that will be helpful to those involved in the design and management of landscaping schemes – and other areas of greenspace – associated with the regeneration of brownfield sites. This will include the production of a design guide for ecologists, planners, developers, landscape architects and land managers.

4.3 Management of existing sites

There are clearly opportunities for existing private and public spaces – including parks, cemeteries and transport corridors – to be managed in a way that enhances their ecological interest. Land managers need information and guidance that provides them with an alternative to the creation and maintenance of bespoke amenity grassland and woodland, to encourage greenspace that incorporates the open, varied habitats characteristic of brownfield. Part of the challenge will be to move beyond the perception that municipal landscapes need to be uniform and ‘tidy’, and to embrace greater diversity of habitats and features.

Management plans will need to foster the continuation of the early successional habitats that support many key invertebrate groups. They should aim to provide a mosaic of habitat features, including a varied vegetation structure, areas of exposed friable substrate and flower-rich grassland. It is also important that long-term monitoring of brownfield habitats (both for invertebrate and plant species) is integrated into management plans, so that examples of successful techniques can be captured and disseminated to others.

4.4 Site protection

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 Wick¹⁰ as an SSSI in 2005 has provided a much-needed benchmark in this respect, however there are other sites of an equivalent and even exceeding quality 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.

¹⁰ Details of the site can be found at www.english-nature.org.uk/special/sss/sss_details.cfm?sss_id=2000497

The planning system has a pivotal role to play in the protection of important brownfield sites. The increasing impetus for directing new development onto brownfield has made this role more important than ever before. Local authorities now have a clear responsibility to safeguard biodiversity. Planning Policy Statement 9 (PPS9) requires local planning authorities to identify brownfield sites of significant biodiversity interest and aim to retain this interest or incorporate it into any permitted development of a site. Further pertinent guidance can be found in Planning Policy Guidance 3 (PPG3), which exempts from its definition of ‘previously developed land’ those sites of recognisable value to nature conservation. Both of these planning policies should offer protection to brownfield sites with significant invertebrate populations, however in practice this is not always happening and nationally important sites are being lost as a result. Local authorities require guidance and information on the ecological importance of many post-industrial sites, the key indicative species and habitats, and mitigation measures which will successfully conserve and enhance populations *in situ*. The provision of site-specific information to planners will also help them to fulfil their duty to conserve and enhance biodiversity.

5. References

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