The state of brownfields in the Thames Gateway

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2013

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1.0 Executive summary

Brownfield sites can be havens for wildlife, supporting rare and scarce invertebrates which have suffered population declines due to the loss of natural habitats in the wider landscape. However, brownfields are frequently targeted for development, despite many being the sole biodiverse green spaces in urban areas. Following the 'All of a Buzz in the Thames Gateway' project to map important brownfield habitat resources in the Thames Gateway, the dataset was revisited to quantify the rate of loss of sites valuable to invertebrates, since their assessment between 2005 and 2007. The 198 sites of High and Medium importance for invertebrates were categorised depending on whether the site was still intact, partially destroyed, completely destroyed or where planning permission had been granted and was therefore likely to be lost in the near future.

This review highlights that over a six-year period, over half (51%) of important brownfields within the Thames Gateway had been lost, damaged or were under immediate threat. The regional breakdown identifies that London has the highest rate of development with over two thirds (69%) of sites lost, damaged or with an outstanding planning permission. This report highlights that the planning system does not deliver safeguards for brownfield habitats and invertebrates of conservation concern, and calls for greater protection and consideration of their value. The rate of development on brownfields is highly unsustainable, putting rare and endangered species at risk of local or national extinction.

2.0 Aims and objectives

The aim of this report is to investigate the loss of important brownfield habitat resources in the Thames Gateway region.

The main objectives of this report are to:

- Revisit the 'All of a Buzz in the Thames Gateway' brownfield dataset to quantify the rate of loss of brownfield sites of value to invertebrates since their assessment between 2005 and 2007
- Identify regional differences in the loss of High and Medium potential sites for invertebrates across the Thames Gateway
- Raise awareness of the importance of brownfield habitats for invertebrates and other wildlife, and the potential cumulative impacts of regeneration and development on rare populations
- Provide recommendations to ensure brownfield habitats and species are better considered in the planning process

3.0 Introduction

3.1. The ecological value of brownfield land

Brownfields are havens for wildlife and can support a huge range of species as indicated by two of the top five most biodiverse sites in the UK being brownfields. Canvey Wick Site of Special Scientific Interest (SSSI) is a former oil refinery in Essex designated specifically for its invertebrate fauna, and supports more biodiversity per square foot than any other site in the UK. West Thurrock Marshes a former power station is home to over 1200 species of insects, birds and reptiles. Despite this wealth of wildlife, brownfield sites are often seen as eyesores or wastelands, and considered to be of little conservation value.

Many of the UK's most threatened invertebrate species can be found on these sites, which also support important populations of Great crested newt (*Triturus cristatus*), Slow worm (*Anguis fragilis*), Common lizard (*Zootoca vivipara*) and Black redstart (*Phoenicurus ochruros*). An estimated 12-15% of nationally rare and scarce invertebrates have been recorded from Britain's brownfields, with some found nowhere else (Gibson 1998). As the value of brownfield land is slowly being recognised, with biodiversity comparable to that of ancient woodland, they are becoming regarded as "the new lowland heaths and flower-rich meadows" (Barker 2000; Jones 2003).

Wildlife-rich brownfield sites develop as a result of abandonment and periodic disturbance, combined with low-nutrient content soils and introduced substrates, such as Pulverised Fuel Ash (PFA) and sandy river dredgings. This results in changes in hydrology and pH, preventing fast growing species from becoming dominant. It is this variation which allows even small sites to contain mosaics of habitats, essential to the survival of many invertebrates due to modern declines of more natural habitats, such as flower-rich grasslands. Rich plant diversity can then develop, especially where drought-stress occurs, supporting a wide range of associated invertebrate species.

Untidy Industries, Basildon, a former vehicle wrecking yard supporting nationally scarce invertebrates © Jamie Robins

Many invertebrates live or overwinter in plant stems or leaves and have complex life-cycles with different habitat requirements at different stages of development, such as bare ground for nesting and nectar-rich flowers to feed (Bodsworth *et al.* 2005). The lack of management in the form of mowing or grazing and a mosaic of different habitats in close proximity to each other, are essential to maintaining invertebrate populations.

The degradation of the wider countryside due to agricultural improvement and development pressures means that brownfield sites are becoming increasingly important within ecological networks, providing refuges and linkages between other more traditional habitats to sustain biodiversity. While individual brownfield sites can support an incredible diversity of plants and animals, it is a network of sites allowing movement around the landscape which is important, providing a much more secure future for scarce invertebrates.

3.2. Biodiversity in the Thames Gateway

The Thames Gateway is famed for its coastal marshes which are known to support a wealth of biodiversity. However, recently it has become clear that the region's brownfield sites are home to assemblages of nationally important invertebrates. At least 15 priority species are strongly associated with brownfield habitats in the Thames Gateway, some of which are found nowhere else in the UK, such as the Streaked bombardier beetle (*Brachinus sclopeta*) and Distinguished jumping spider (*Sitticus distinguendus*). The region also contains the most important UK population of the Shrill carder bee (*Bombus sylvarum*) with relatively high colony numbers throughout the region, which rely heavily on the wildflower resources of brownfields (Ellis *et al.* 2006; Connop *et al*. 2011). In addition, over 100 Red Data Book (RDB) species and over 400 Nationally Scarce species have been recorded on brownfield sites in the region (Buglife 2008). The Thames Gateway supports a remarkable number of rare and scarce bees and wasps, including 74% of the national fauna (Harvey 2000).

Left: Shrill carder bee © Steven Falk. Right: Brown-banded carder bee © Sam Ashfield

The Thames Gateway has a unique climate, more continental than the rest of the UK, from low rainfall causing soil water deficit, higher than average temperatures and sunshine levels in summer, and mild winters. The climate helps to maintain dry, open habitats, allowing wildlife with Mediterranean elements to develop, many at the northerly limits of their range and unable to survive elsewhere in the UK (Harvey 2000).

Much of the important wildlife in the Thames Gateway is associated with dry, flower-rich, open grasslands on nutrient-poor sands and gravel traditionally found in the former Thames Terrace Grassland communities. Very little of this habitat remains, resulting in characteristic fauna being increasingly dependent on the network of open habitats that develop on brownfields.

The habitat mosaics that have developed on nutrient-poor substrates in PFA and silt lagoons, and abandoned sand and gravel quarries, now act as important refugia for plants and animals that once were widespread in the region. Unmanaged flower-rich grasslands with sparsely vegetated areas, developed over many years on poor substrate, are a key part of the extensive mosaic of habitat. Because of the warm microclimate of the Thames Gateway, they support a range of thermophilic species at the edge of their range in southern England (Harvey 2000).

3.3. Threats to brownfield land in the Thames Gateway

The Thames Gateway is Europe's largest regeneration area and the UK's largest economic programme, stretching over 40 miles and aiming to encourage economic growth throughout the Greater South East. Central to the economic policy is the large volume of brownfield land that can be redeveloped for housing and business, with the eventual aim of creating 110,000 new homes and 225,000 new jobs by 2016 (Department for Communities & Local Government 2007). Much of this new development is taking place on the derelict industrial areas and wharves which make up the largest area of brownfield land in the south of England.

Unfortunately, many of the rare invertebrate species found in the Thames Gateway rely on a network of suitable, high-quality brownfield sites within close proximity to each other. The persistent degradation and fragmentation of habitat could lead to populations becoming isolated and cause localised extinctions. Species that are restricted to only one or two sites are even more vulnerable. The loss of a single site has the potential to bring about national extinction of a species.

3.4. Planning - invertebrates and brownfield land

The Government has recognised the importance of wildlife-rich brownfield sites through the National Planning Policy Framework (from hereon referred to as 'the Framework'). The core land use planning principles state that planning should '*encourage the effective use of land by reusing land that has been previously developed (brownfield land),* ***provided that it is not of high environmental value***' (Paragraph 17, Department for Communities & Local Government 2012).

The Government's biodiversity strategy, Biodiversity 2020, states '*We will retain the protection and improvement of the natural environment* ***as core objectives of the planning system***' (Paragraph 20, Department for Environment, Farming and Rural Affairs 2011). This strategy provides a framework for achieving the UK's international and EU commitments to biodiversity.

Open Mosaic Habitat on Previously Developed Land is a priority habitat in England. This habitat is concentrated in, but not confined to, urban and former industrial landscapes and has been included on this list primarily in recognition of its value for invertebrates. In addition to this, a number of invertebrate species associated with brownfield land are priority species in England. Priority habitats and species have been selected as they are under threat because of their rarity and rate of decline. Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 lists the priority species and habitats for England; these were originally identified as requiring action under the UK Biodiversity Action Plan (UK BAP).

Section 41 lists should guide decision makers and help them to fulfil their general duty 'to have regard to the conservation of biodiversity' under section 40 of the NERC Act 2006. The Section 41 list is to help Local Planning Authorities identify those species and habitats that need to be protected from harm. They are a material consideration during planning and development control decisions. They also are a basis to enable Local Authorities to '*promote the preservation, restoration and re-creation of priority habitats, ecological*

networks and the protection and recovery of priority species populations' and helping to achieve the Government's aim of halting biodiversity loss, as stated in The Framework (Paragraphs 117 and 109, Department for Communities & Local Government 2012).

3.5. All of a Buzz in the Thames Gateway

Between 2005 and 2008, Buglife collaborated with English Nature (now Natural England) on the 'All of a Buzz in the Thames Gateway' (All of a Buzz) project. The project was the first to quantify the ecological importance of brownfield land for biodiversity at a landscape scale and developed a new rapid approach to identifying key sites for invertebrates.

The largest brownfield study to date, over 6,900 hectares were mapped before assessing the ecological value of 450 sites. Habitat assessments were undertaken to indicate the likely quality of the site for invertebrate populations, based on key features known to be important for invertebrates on brownfield land.

The definitions of habitat quality were as follows:

High- likely to support RDB (Rare, Vulnerable and Endangered) and priority species. The overall level of biodiversity will almost certainly be regionally important, and possibly nationally important. There will be considerable barriers to sustainable development on such sites, with extensive mitigation and compensation put in place to avoid loss of biodiversity

Medium- will probably support RDB and priority species as part of a regionally or locally important assemblage. Mitigation and compensation must be carefully planned and extensive if no net loss of biodiversity is to be achieved.

Around 7,500 invertebrate species records were collated from a range of recorders and environmental assessment reports. Almost 3,000 of these were recorded on brownfield sites, of which over a third were identified as species of conservation concern. The key finding was that 198 sites (over 40%) showed High or Medium potential for invertebrate biodiversity.

4.0 Methodology

4.1. Revisiting the All of a Buzz dataset in 2012

The aim of reviewing the sites identified in All of a Buzz was to examine the rate of loss of the 198 valuable Medium and High quality brownfield sites. Therefore, it was not necessary to undertake detailed ecological evaluations of the sites again, but to investigate the loss of useful features and sites. Mapping information from All of a Buzz formed the basis of this work, with MapInfo Professional 9.5 used to update the dataset and produce a new layer.

The primary means of examining the current status of the previously identified brownfield sites was through examining recent aerial images and monitoring planning applications. Where necessary, comparison was made to earlier aerial images, to confirm the loss of sites and important features which were identified in the site database by recorders at the time of habitat assessment. These 198 sites were therefore re-examined and subsequently categorised into one of the following:

Intact- the site remains intact and retains the key features identified in habitat assessments from the original All of a Buzz database and should remain so in the short-term as there are no outstanding planning permissions.
Destroyed- the site has been destroyed for development, site clearance, inappropriate restoration, infilling or agriculture for example, and has lost all of the features which made it valuable for invertebrates.
Partially Destroyed- a considerable area of the site has been destroyed, but some features of interest that were identified in the All of a Buzz habitat assessment remain.
Planning Permission Granted- planning permission has been granted to destroy a site, but ground works may not have started, although the loss of the site is expected imminently. Excludes sites where planning permission was either undecided by the end of 2011 or had expired without application for a renewal. This is not confirmation that the site will definitely be lost, but suggests that the loss of the site is imminent in the short-term.

Ground truthing (the process in which on-site visits are undertaken to investigate the accuracy of aerial imagery) was undertaken across the region. Over a third of the sites identified in this report (77 of 198) were visited. Attempts were made to review a greater proportion, but there were time constraints and access issues. Of the 77 sites visited, aerial images determined that 19.5% were either Destroyed or Partially Destroyed. However, ground truthing determined this figure to be 27.3%. This suggests that only 71.4% of sites which were confirmed as lost by visiting the site were successfully detected by using aerial imagery, indicating analysis using aerial images is likely to significantly underestimate development rates.

Planning applications for local authorities throughout the Thames Gateway region were monitored to enable sites to be accurately described as having 'Planning Permission Granted'. It is assumed that these sites may be lost in the short-term, although this is not a definite indication, as not all permissions are subsequently followed through. All of the sites in this category have outstanding planning permissions for activities that would be expected to lead to the loss of invertebrate interest, with permissions for minor activity on site excluded. However, the fact that planning permission could be granted on valuable sites, with the expected loss of interest, shows that the site is under risk of destruction in the short-term, and allows these sites to be used alongside 'Destroyed' and 'Partially Destroyed' sites in some sections of the results and analysis.

The results are considered to be up-to-date as of the end of 2011. Any planning permissions that remained undecided at this point were assumed to have been refused, to prevent overestimating rates of development. However, it is likely that many will have been granted and that the number of planning applications cited here will actually be an underestimate of the real value. Information on sites which were lost during the All of a Buzz project period were collated from the original GIS layers and site databases, to allow for an accurate estimate to be made of loss of sites since the project.

4.2. Limitations of the dataset and analysis

Datasets examining development are always a 'picture in time' as development is dynamic and cumulative, and there is the possibility of a number of significant brownfield sites changing status very quickly. It must be remembered that in the few years prior to All of a Buzz, sites were already being lost rapidly, so many would have been excluded from assessment or assessed as being of lower value than they would have been a short time previously.

Ground truthing was used as the fast pace of development quickly makes up-to-date aerial images redundant, while the age of images across the region varies significantly. However, it remains likely that some sites

categorised as ‘Planning Permission Granted’ have been ‘Destroyed’ or ‘Partially Destroyed’ but this could not be proven due to out-of-date aerial imagery and difficulty accessing sites.

It is likely that some planning permissions have been overlooked where multiple names have been assigned to individual sites, and as a result of some local authority planning portals removing associated documents once planning decisions had been made, making it difficult to assess the likely impact of developments or to identify the affected areas.

It was not possible to discuss losses of habitat in context of total area as the site assessments were often made of specific features that cover only a proportion of a site, so their use would have over-exaggerated the extent of losses.

5.0 Results

The results are examined first in the context of the Thames Gateway as a whole, followed by a breakdown of the rate of site loss experienced by the London, Essex and Kent regions individually. Maps showing the distribution of sites are presented as appendices.

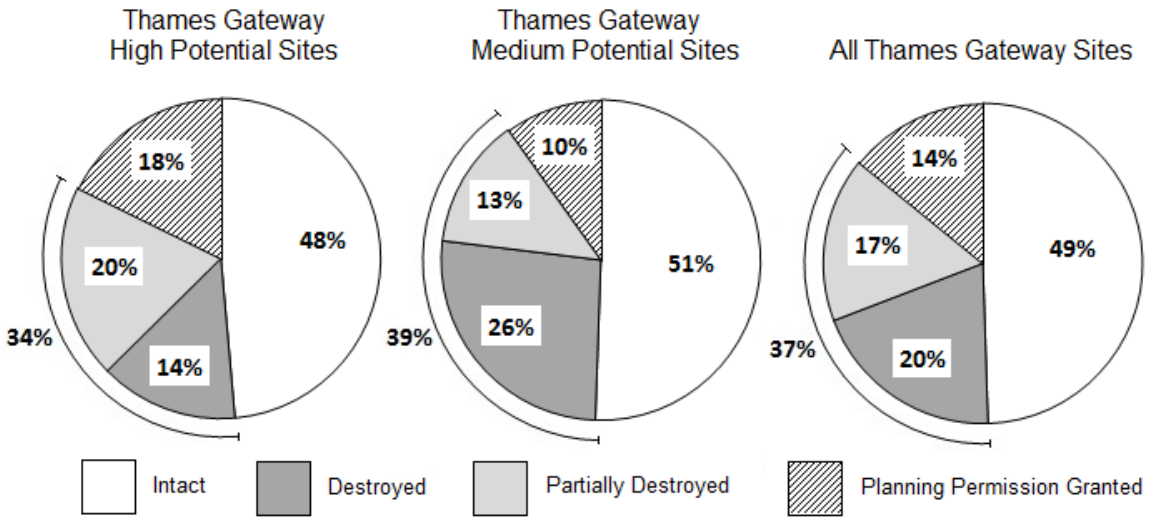
5.1. Thames Gateway

Only 49%, or 98 out of the 198 sites assessed as being of Medium or High potential for invertebrates in the Thames Gateway, are intact and do not have a planning permission granted that would be expected to cause the loss of interest at the site. Regardless of granted planning permissions, over a third of sites have been impacted, with 34% of High potential and 39% of Medium potential sites either destroyed or partially destroyed across the region to date. When planning permissions are included and it is assumed that development will progress, the proportion reaches over half of all sites, with only minimal difference between the loss of Medium potential (49%) and High potential (52%) sites.

Table 1: Results for all sites in the Thames Gateway

Habitat Value	Total No. of Sites	Intact	Partially Destroyed	Destroyed	Planning Permission Granted
High	107	52	21	15	19
Medium	91	46	12	24	9
Total	198	98	33	39	28

Figure 1: Pie charts showing the proportions of Thames Gateway sites that are intact, destroyed or with a planning permission granted



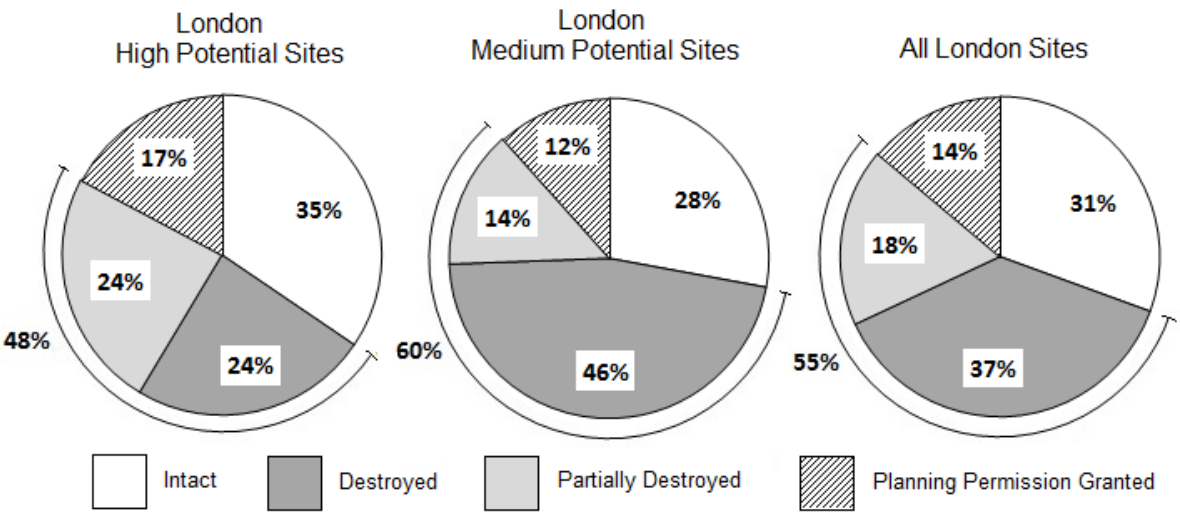
5.2. London

The London area shows the highest development rates in the region with over half of all sites impacted. At least 60% of Medium potential and 48% of High potential sites have already destroyed or partially destroyed. When planning permissions that have been granted are considered and assumed to progress, less than a third of sites will remain, with 72% of Medium potential and 65% of High potential sites destroyed or partially destroyed. Should these planning permissions result in the loss of sites, only 22 of the 72 sites assessed as being of Medium or High potential will remain intact.

Table 2: Results for sites in the London area

Habitat Value	Total No. of Sites	Intact	Partially Destroyed	Destroyed	Planning Permission Granted
High	29	10	7	7	5
Medium	43	12	6	20	5
Total	72	22	13	27	10

Figure 2: Pie charts showing the proportions of London sites that are intact, destroyed or with a planning permission granted



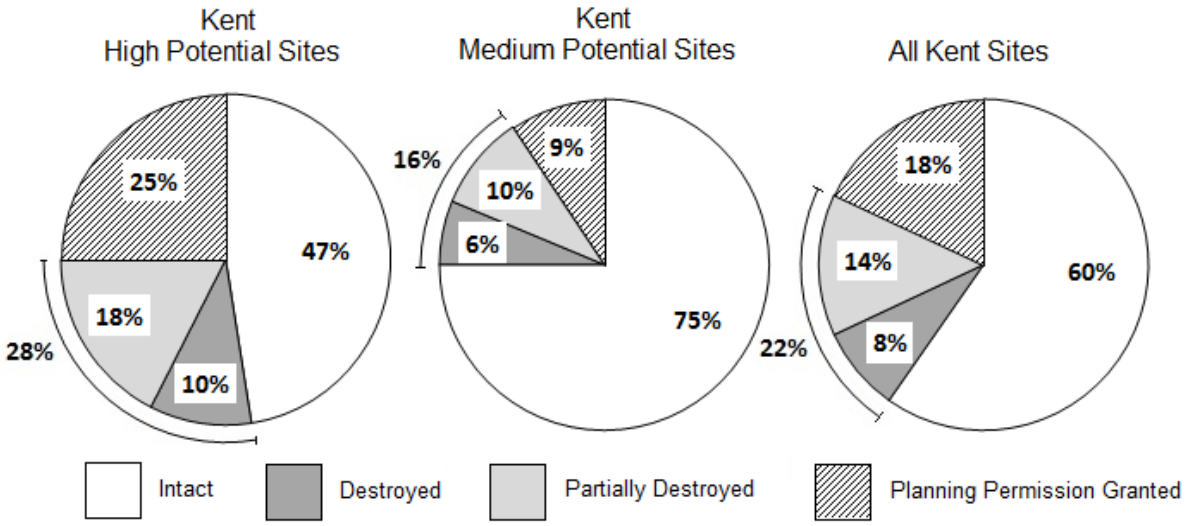
5.3. Kent

Kent has lost just over a fifth of its sites (22%), with at least 16% of Medium potential and 28% of High potential sites destroyed or partially destroyed to date. Even when outstanding planning permissions are considered, 75% of Medium potential sites remain intact and safe in the short-term. However, when High potential sites alone are considered, a quarter currently have planning permission granted, which could result in 53% of sites being lost in the Kent area within only a few years. Taking into account the stark difference in planning permissions granted between Medium and High potential sites, when the data is combined, 60% of sites are considered to be intact and free of outstanding planning permissions.

Table 3: Results for sites in the Kent area

Habitat Value	Total No. of Sites	Intact	Partially Destroyed	Destroyed	Planning Permission Granted
High	40	19	7	4	10
Medium	32	24	3	2	3
Total	72	43	10	6	13

Figure 3: Pie charts showing the proportions of Kent sites that are intact, destroyed or with a planning permission granted



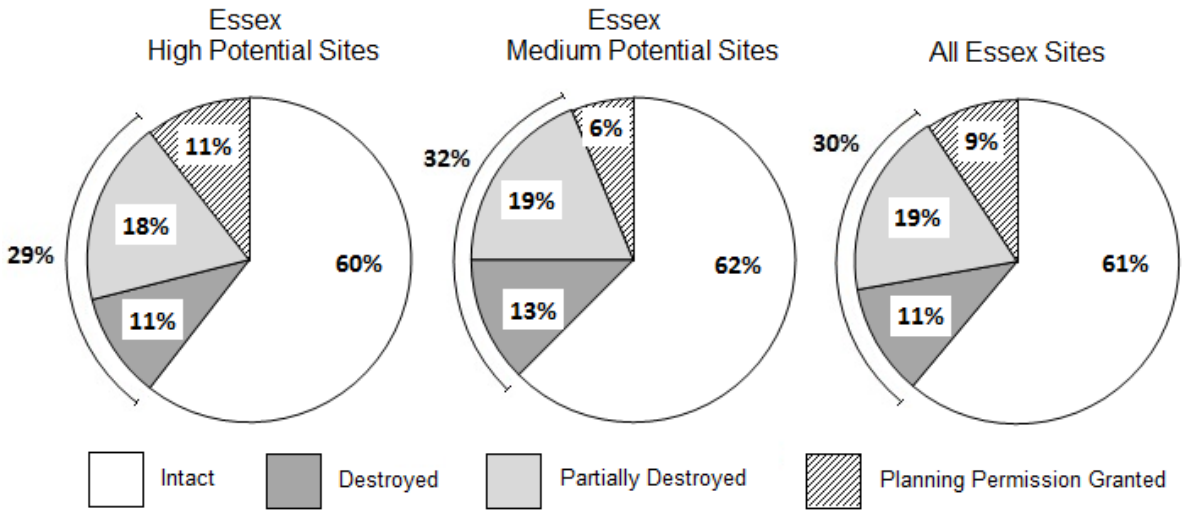
5.4. Essex

At present, 29% of High potential and 32% of Medium potential sites have been impacted in Essex, which may potentially rise to 40% and 38% respectively should planning permissions which have been granted progress. The Essex area does, however, have the highest proportion of sites intact and free of planning permissions, with 61% of all sites currently safe. There appears to be relatively little difference between Medium and High potential sites, as is apparent from the pie charts below.

Table 4: Results for sites in the Essex area

Habitat Value	Total No. of Sites	Intact	Partially Destroyed	Destroyed	Planning Permission Granted
High	38	23	7	4	4
Medium	16	10	3	2	1
Total	54	33	10	6	5

Figure 4: Pie charts showing the proportions of Essex sites that are intact, destroyed or with a planning permission granted



6.0 Discussion

6.1. Current brownfield losses are unsustainable

Development and regeneration are undoubtedly resulting in the loss of a significant proportion of wildlife-rich brownfields across the Thames Gateway. 100 of the 198 sites identified in the original 'All of a Buzz in the Thames Gateway' project as being of High or Medium potential for invertebrates between 2005 and 2007 were found to be destroyed, partially destroyed or with an outstanding planning permission likely to damage their invertebrate fauna. These figures are likely to be an underestimate, with ground truthing suggesting that assessment using aerial images only successfully detected 71.4% of lost sites, while all undecided planning applications at the end of 2011 were assumed to have been refused for the purpose of this study.

All of a Buzz highlighted the importance of sites across the Thames Gateway, to allow planners and decision makers to be better informed of the high biodiversity value of some brownfields. However, despite the increase in recognition of the importance of brownfields from the report, high profile losses and campaigns, and its inclusion as a priority habitat for conservation, habitat loss continues with potentially serious consequences for the region's invertebrates, including Species of Principle importance/Section 41 NERC Act listed species.

Against the background of habitat loss, the Thames Gateway aims to become the UK's first "eco-region" claiming that regeneration and creation of greenspace will "boost the Gateway's biodiversity assets", producing a landscape comparable to a national park (Department for Communities & Local Government 2007; Department for Communities & Local Government 2008a,b; Farrell 2009).

6.2. Protecting wildlife-rich brownfields

The failure to protect over 50% of the sites reviewed shows that there is insufficient protection of high value brownfield sites. Much of this habitat was lost despite qualifying as Open Mosaic Habitat on Previously Developed Land priority habitat (Habitat of Principal Importance) and likely supporting the rare, endangered and priority invertebrates found in the region. It is essential that brownfields are considered individually as well as a landscape scale resource. Each site should be assessed on its own merits and assessed fully for its ecological value. This should ensure the most wildlife-rich brownfield sites are protected from development or that developments are designed sympathetically to minimise impacts with adequate mitigation and compensation secured.

Local authorities and decision makers need to be more aware of the importance of brownfields and the need for proper ecological survey work to ensure no net loss of biodiversity, in line with the Framework. Many developments have been permitted without the requirement of an ecological assessment or invertebrate survey and this has resulted in either inappropriate and/or ineffective mitigation or compensation.

Brownfields have the potential to contribute significantly to the priorities and key actions in the England Biodiversity Strategy and the UK post-2010 Biodiversity Framework. Similarly, they have an important role in urban green infrastructure, sustainability and provide ecosystem services that are often overlooked but underpin our social and economic wellbeing. It is hoped that sites such as Canvey Wick will promote the positive contribution that brownfields can make to biodiversity while being open spaces enjoyed by the community and useful educational resources.

6.3. Impacts on rare Thames Gateway invertebrates

Brownfields in the Thames Gateway are highly diverse and support many nationally rare and scarce species. As a result of the degradation of the wider countryside, many species now depend on brownfields, which provide refuges and stepping stones within the wider landscape. In many urban areas, brownfields are one of the few areas of high biodiversity and important sites should be considered as essential green infrastructure.

The loss of swathes of high quality brownfield habitat is likely to have a large negative impact on the rare invertebrates that are characteristic of the Thames Gateway. The loss of varied features and habitats across the landscape to development runs the risk of rare species being completely lost from the regional and national fauna. Flagship species such as the Shrill carder bee and the Brown banded carder bee (*Bombus humilis*) require 10-20 square miles of habitat mosaic that includes wildflower rich forage (Edwards 2002). Like many Thames Terrace grassland invertebrates, these species exist in metapopulations, with natural cycles of local extinction balanced by re-colonisation from nearby sites, allowing their survival across the landscape. Fragmentation and isolation of populations, where key brownfields with large expanses of wildflowers are lost, could significantly reduce species movement in and around urban areas, thus weakening nationally important metapopulations.

Other species such as the Distinguished jumping spider and Streaked bombardier beetle are restricted to only one or two sites with very specific habitat requirements, and could be lost from the national fauna through a single inappropriate development. There is often a time lag between habitat loss and the disappearance of species, meaning that damage has likely already been done and making immediate protection even more urgent.


Two species restricted to only one or two sites in the UK, Distinguished jumping spider (left) © P R Harvey, and the Streaked bombardier beetle (right) © Craig Slawson

6.4. London's lost brownfields

The steep decline in the number of High and Medium potential sites in London is of great concern, with only 31% of the sites identified in the All of a Buzz report intact and free of outstanding planning permissions. This includes a number of large scale and highly publicised development projects aiming to regenerate East London, such as the Olympic Park in Stratford, the Barking Riverside Project and the Greenwich Peninsula. It is likely that the development pressure on large brownfield sites will continue, as they have been made central to meeting the targets for the Thames Gateway regeneration of creating 110,000 new homes and 225,000 jobs (Department for Communities & Local Government 2007).

6.5. The future for Essex and Kent

The brownfields of Essex and Kent, despite substantial losses, remain comparatively less threatened than those in London, with 61% and 60% of sites intact and free of outstanding planning permissions respectively. However, both areas still demonstrate high losses of valuable wildlife-rich brownfields, with losses expected to continue. With large brownfield sites in London becoming fewer and fewer, it is likely that the demand for land for business and housing will soon outstrip supply. This raises the threat that development will move east along the Thames and put even greater pressure on riverside sections of Essex and Kent that have been spared to date. There is already mounting pressure to develop larger wildlife-rich brownfield areas such as those in Purfleet, which have recently been granted planning permission, and Swanscombe where plans for a Paramount theme park have already led to significant media coverage, and this is likely to intensify.

7.0 Conclusions

It is clear from this study that the planning system does not deliver safeguards for invertebrate conservation and brownfield habitats. New development has resulted in over half of important brownfield sites in the study area being either lost or in immediate threat. Many planning permissions were granted without appropriate ecological assessment and as a consequence little, no or inappropriate mitigation was secured.

This review demonstrates that losses of brownfield land, a key invertebrate habitat, within Thames Gateway, London, Kent and Essex are staggering. 51% of important sites have been lost, partially lost or damaged, or have been granted planning permission over a six year period. In the Thames Gateway, of 198 high and

medium potential sites, only 98 are still intact and free of immediate danger. London displays the highest rate of loss with only 22 intact sites from an original 72 high and medium potential brownfield sites. Kent and Essex have a slightly lower level of loss with 43 out of 72, and 33 of 54 sites intact, respectively.

Despite a high profile legal campaign by Buglife to overturn planning permission, part of the former power station site at West Thurrock Marshes, one of the most biodiverse sites in the country, has been lost to a warehouse development. This highlights the weakness of the application of biodiversity legislation in the planning system, namely the Natural Environment and Rural Communities Act (2006). This legal protection cannot be relied on to protect wildlife-rich brownfield land.


Left: Remnant wildlife-rich brownfield on West Thurrock Marshes, one of the UK's most biodiverse sites © Steven Falk. Right: New development on part of West Thurrock Marshes © Steven Falk

The National Planning Policy Framework specifies that brownfield sites of high environmental value should not be developed. This level of protection has been carried forward from the now obsolete Planning Policy Statement 9. The average loss of 51% of important brownfield sites shows that this aspiration is failing and that additional safeguards are required to ensure that important brownfield sites are not destroyed. Without a definition of high environmental value the Framework does not go far enough to ensure important brownfield sites are protected.

Outside of the Thames Gateway, the level of loss is unclear as the existing wildlife-rich brownfield reserve is largely unknown. However, many major urban centres have undergone regeneration projects which have led to the losses of large tranches of brownfields, much of which is likely to have been extremely valuable to wildlife. This could be compounded by a lower awareness of the importance of brownfield land in other parts of the UK, despite growing evidence that they are often the last remaining areas of wildlife-rich habitat.

Invertebrates make up the majority of biodiversity but are in decline with few species being actively conserved. There are an ever increasing number of invertebrates that are, or soon could be, critically endangered. Major threats to species include habitat loss and fragmentation, climate change and, as documented by this study, cumulative development pressures.

Securing suitable management of brownfield sites is another challenge, as many brownfield sites are privately owned. Currently there are no financial incentives for site owners to retain, manage or enhance brownfield habitats for biodiversity. Future priorities include incorporating brownfield sites into funded management schemes such has Higher Level Stewardship (HLS), exploring the role of biodiversity offsetting and ensuring brownfields are represented in the SSSI, Local Nature Reserve and Local Wildlife Sites series.

Brownfield land is of increasing value to wildlife as the wider countryside is progressively degraded. They act as refuges for species, providing linkages between other more traditional habitats and helping to sustain biodiversity. This continued loss of important sites, across the UK, could have a disproportionally large effect on the UK's wildlife. The Framework outlines the Government's aim to halt the overall decline in biodiversity by establishing coherent ecological networks. Increased protection of high and medium value brownfield sites would directly contribute to this aim and should be of high priority for local authorities.

8.0 Recommendations

This report identified substantial losses of important brownfield sites as a result of new development and the failure of brownfield safeguards within the planning system. To enable better protection of these sites this report calls for:

- A higher level of protection for brownfield sites of biodiversity value to ensure these are not developed.
- A UK wide inventory of Open Mosaic Habitat to be developed and held by the appropriate statutory body. This has already partly been developed for some regions of the UK (e.g. North East and Midlands).

A high level of responsibility lies with local authorities to ensure that brownfield habitats and species are better considered in the planning system. Local authorities need to ensure:

- A definition of 'high environmental value' within their Local Plan or associated guidance.
- A landscape and strategic approach to brownfield re-development. Local authorities should identify areas of open mosaic habitat on previously developed land within their authority boundary and designate important sites. Areas of low environmental value can be put forward for development.
- Brownfield sites are assessed using Open Mosaic Habitat criteria and the appropriate invertebrate surveys carried in advance of planning decisions to inform development control decisions.

9.0 Case studies

9.1. Barking Riverside

Over the next 20 years, 10,000 homes will be created on 185ha of brownfield consisting of PFA landfill and small industry. The history of disturbance and deposition of material created a mosaic of PFA dunes, wildflower-rich grassland, scrub and ditches, which supports nationally rare species, and has records of 37 bee species alone to date. Much of the high quality habitat will be lost, however there have been some attempts to minimise the impacts on wildlife by retaining the 4ha Ripple Local Nature Reserve and integrating invertebrate friendly features into a green corridor. Barking Riverside is an example of where some consideration has been taken to protect brownfield biodiversity, however, large-scale biodiversity losses are still expected.

9.2. Chafford Hundred

The 240ha Chafford Hundred development was once an extensive network of chalk quarries containing a diverse mosaic of wildflower-rich grasslands, sandy slopes, chalk banks and sand cliffs, supporting a nationally important assemblage of rare Hymenoptera and Diptera. However, despite the 5,000 residential units and

associated infrastructure, two pits were retained and managed by the Essex Wildlife Trust as the Chafford Gorges Nature Reserve, with sand cliffs and wildflower grasslands created. The Diptera fauna has survived relatively well, and despite aculeate Hymenoptera suffering disproportionately large losses, both faunas remain of national importance, demonstrating the importance of protecting large brownfield resources in the landscape.

9.3. Untidy Industries

Once a former vehicle wrecking yard, Untidy Industries comprises 7.5ha of contaminated land and low nutrient substrates, supporting valuable early successional habitat. Until Buglife's intervention, most of the site was heavily scrubbed over, threatening the invertebrate interest. Much of the scrub will now be cleared and the site managed by Basildon Council as an exemplary brownfield site, using the rubble and chalk piles found on site and encouraging wildflowers. Untidy Industries will show how brownfields can be managed for public access, and be useful ecological, recreational and educational resources to benefit the whole community.

9.4. West Thurrock Marshes

West Thurrock Marshes is a former power station site covered in PFA with an outstanding invertebrate assemblage. A complex mosaic of bare ground, wildflower grassland and ditches supports 36 Red Data Book species, and brownfield BAP species such as Shrill carder bee, Brown-banded carder bee, and Distinguished jumping spider, and a host of other species of conservation importance. Despite its importance for invertebrates and the objections of numerous NGOs, approval was given for a warehouse development. Buglife's high profile legal attempts to overturn planning permission at the High Court and Court of Appeal were unsuccessful. West Thurrock Marshes serves to demonstrate the weakness of biodiversity protection legislation in the planning system.

9.5. Buckman's Hill Quarry

In 2008, an application was submitted to fill Buckman's Hill Quarry, part of a Local Wildlife Site, and return the land to agriculture. The disturbed sand and gravels of the site offer habitat for UKBAP species including the Hornet robberfly (*Asilus crabroniformis*), Brown-banded carder bee and Five-banded weevil-wasp (*Cerceris quinquefasciata*). Thanks to the objections of conservation organisations, including Buglife, the application and subsequent appeal were refused for failing to appropriately consider the site's biodiversity. The site will now be allowed to naturally develop its high quality mosaic habitat.

9.6. Canvey Wick SSSI

Buglife helped Canvey Wick become the first brownfield designated as a SSSI specifically for its invertebrates, after a three year campaign to protect the site and its nationally important assemblage. Developed as an oil refinery in the 1970s, the site was decommissioned without ever becoming operational and after vast amounts of sand and silt had been deposited, which over time has developed a complex mosaic of herb-rich grassland, early successional vegetation, bare ground and brackish areas. This rich mosaic supports over 1,400 invertebrate species, including 32 endangered species, 120 Nationally Scarce species and three which were previously presumed extinct in the UK. A management plan for part of the site is being designed by Buglife and the RSPB, in partnership with the Land Trust, to safeguard the wildlife interest. However, despite SSSI status, a road was constructed that bisects the site's south east corner, revealing the inadequate protection biodiversity receives- despite Canvey Wick supporting the highest biodiversity per square foot in the UK!

Canvey Wick SSSI © Steven Falk

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11.0 Additional resources

Additional information and data related to this report is available from Buglife on request, including:

- High resolution maps of the current status of High and Medium sites assessed during the 'All of a Buzz in the Thames Gateway' project
- A 2011 GIS layer containing information on the brownfield sites identified during the 'All of a Buzz in the Thames Gateway' project
- The original 'All of a Buzz in the Thames Gateway' maps
- Buglife-The Invertebrate Conservation Trust (2009) *Planning for Brownfield Biodiversity- a Best Practice Guide*. Buglife, Peterborough.
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12.0 Acknowledgements

Thanks to the funders of the Buglife South Essex Stepping Stones project: The Tubney Charitable Trust, Veolia North Thames Trust (formerly Veolia ES Cleanaway Pitsea Marshes Trust) and Essex Environment Trust. Thanks also to the authors and field surveyors of the original 'All of a Buzz in the Thames Gateway' report, which formed the basis of this report. Many thanks to Getmapping Plc, for the provision of up-to-date aerial images and a Web Map Service. Thanks also to GiGL (Greenspace Information for Greater London) and Kent Wildlife Trust for providing additional information.

13.0 Appendices

13.1. Map showing distribution of all Medium potential sites for invertebrates

Map showing location of sites identified as being of **Medium** potential for invertebrates, categorising sites as either intact, destroyed/partially destroyed or having planning permission granted.

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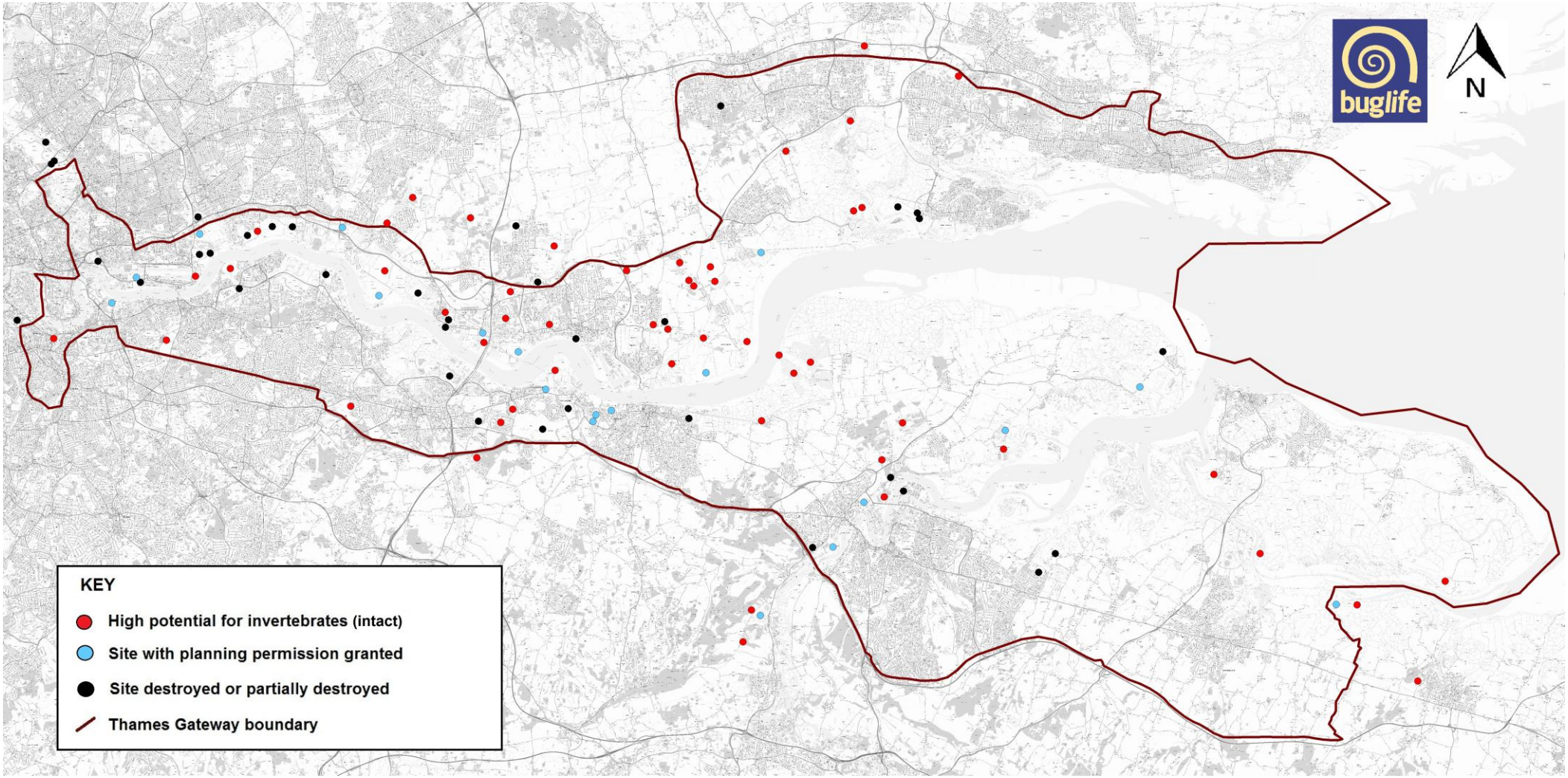
13.2. Map showing distribution of all High potential sites for invertebrates



Map showing location of sites identified as being of **High** potential for invertebrates, categorising sites as either intact, destroyed/partially destroyed or having planning permission granted.

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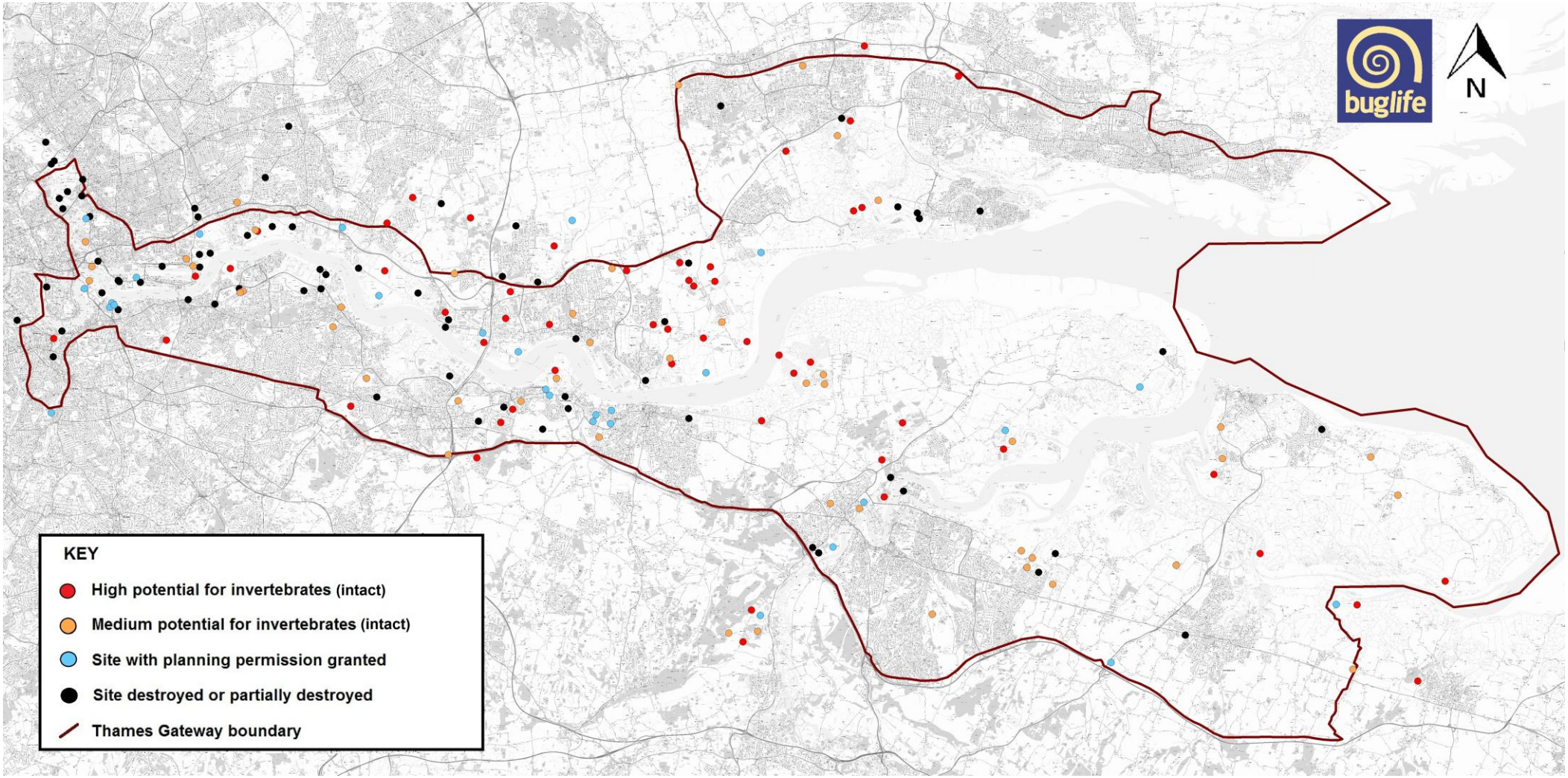
13.3. Map showing distribution of all Medium and High potential sites for invertebrates



Map showing location of sites identified as being of **Medium** and **High** potential for invertebrates, categorising sites as either intact, destroyed/partially destroyed or having planning permission granted. Contains Ordnance Survey data © Crown copyright and database right 2013 (Licence information: http://www.ordnancesurvey.co.uk/oswebsite/docs/licences/os-opendata-licence.pdf)