

**Assessment of likely significant effect carried
out under Regulation 48(1) of the Conservation
(Natural Habitats &c.) Regulation 1994**

Kingston Town Centre Area Action Plan

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1 Introduction

1.1 Background

Royal Borough of Kingston Upon Thames (referred to in this report as RB Kingston) has prepared a submission draft Kingston Town Centre Area Action Plan (March 2007). The Area Action Plan (AAP) is part of the Council's emerging Local Development Framework for the Borough, and it sets out planning policy for Kingston Town Centre for the period to 2020.

In the AAP the Council observed that in 2001 it was recognised that Kingston was a successful metropolitan centre, but there were concerns about its attractiveness and vitality, following a loss of daytime visitors and an increasingly vibrant night-time economy. The Council also reported that (in 2001) "several large development schemes were nearing completion and there was pressure for further development, set against a shortage of sites and land for town centre expansion."

In response to these concerns the Council undertook to prepare a strategy for the town centre, to be known as K+20 (which is the AAP referred to previously). The Plan, which has been prepared following extensive public and stakeholder consultation, provides the spatial framework to guide future development and improvements in the town centre.

The Council is also aware of the town centre's proximity to two Special Areas of Conservation (SACs), which are considered to be of European importance for the species and habitats that they support. With this in mind RB Kingston has appointed Baker Shepherd Gillespie to carry out an assessment of the AAP and its potential implications for the two SACs.

1.2 Future Development

RB Kingston has commissioned a series of specialist studies, which are described within the AAP. The results of these studies show that Kingston has a diverse economy, but that there is a need to improve facilities across a range of sectors, including commercial, retail, leisure and residential.

Within the AAP it is stated that the broad scope of development envisaged by 2020 includes the following key elements:

- New retail facilities (up to 50,000m² of floor space by 2016)
- Approximately 1,000 new homes
- New and upgraded offices
- New facilities for Kingston University and Kingston College

The primary purpose of the AAP is to maintain and develop Kingston Town Centre as a thriving metropolitan area. This is summarised in Key Objectives 1 and 2 within the AAP:

- To maintain a diverse and sustainable economy, providing for business and employment development needs with a wide range of employment opportunities.
- To enhance the quality and range of town centre uses and attractions and provide housing, including affordable housing.

If the broad scope of development described within the AAP is realised, this will result in an increase in the number of local residents and an increase in the number of visitors to the town centre. Whilst the overall thrust of the AAP is to create facilities that will attract visitors to and retain visitors within the town centre, it is recognised that residents will require recreational facilities. Leisure is addressed in the following Key Objectives (KO):

- KO5: To promote and enhance use of the river and riverside
- KO6: To improve transport, access and connectivity for all

Key Objective 6 includes two Policies (K17 and K18) aimed at improving the pedestrian and cycling environments respectively. Collectively, these Policies will help to reduce the number of visitors and residents that are likely to travel to Richmond Park SAC and Wimbledon Common SAC.

Plan 30 from the AAP, which is reproduced below, shows the Character Areas, Proposal Sites and Key Areas for Conservation. Detailed descriptions of the development proposals for each of these areas is provided in the AAP. The ten Character Areas shown on Plan 30 are described within the AAP as follows:

- Character Area 1 – Prime shopping
- Character Area 2 – South East
- Character Area 3 – Eastern Approach
- Character Area 4 – Kingston Station and its approaches
- Character Area 5 – Riverside North
- Character Area 6 – Historic Core of the Old Town Conservation Area
- Character Area 7 – Riverside South – Old Town Conservation Area
- Character Area 8 – High Street area of Old Town Conservation Area
- Character Area 9 – Civic and Education
- Character Area 10 – North Kingston



1.3 Proximity to European Sites

Various documents which have been prepared in relation to the protection of SACs are also considered to be relevant to this site. 'The Dorset Heathlands Interim Planning Framework 2006-2009' (1 January 2007) has been prepared to provide guidance on planning matters within 5km of heathland sites. A 5km area has been defined around heathland in South-West England by Natural England, as it is considered likely that these sites may be impacted by development within this area.

A similar document entitled 'Thames Basin Heaths: A new approach to housing allocations and nature conservation' has been prepared for heath sites in South-East England by Natural England. This document proposes a zonal approach to planning, very similar to that prescribed for the Dorset heathlands.

In light of the above guidance it has been decided to assess the impact of the proposed redevelopment of Kingston town centre on European sites located within a 5km radius search area. European sites outside this area have not been considered, as they are considered to be distant enough to obviate the need for any further assessment. Examination of the Natural England database www.natureonthemap.gov.uk has revealed that the nearest European sites, other than those listed below, are more than 10km away.

Two European sites have been identified within 5km of Kingston town centre: Richmond Park Special Area of Conservation (1km to the north-east) and Wimbledon Common Special Area of Conservation (3km to the east).

1.3.1 Richmond Park Special Area of Conservation

Kingston Town Centre is located approximately 1km (at its closest point) to Richmond Park Special Area of Conservation (SAC). Richmond Park has been managed as a royal deer park since the seventeenth century, and consequently supports a diverse range of habitats of value to wildlife. In particular, Richmond Park is of importance for its diverse deadwood beetle fauna associated with the ancient trees found throughout the parkland. In addition the Park supports an extensive area of dry acid grassland.

Although the Park supports a diverse range of habitats and species, its designation as a SAC is because it supports an internationally important population of the Annex II ¹ species stag beetle *Lucanus cervus*.

A condition assessment is available for the Site of Special Scientific Interest, which covers the same area as the SAC. Although this assessment is now out of date it does provide a useful indication of the issues that currently affect the site. The condition assessment table is presented in Appendix 1

1.3.2 Wimbledon Common SAC

Wimbledon Common SAC is located approximately 3km (at its closest point) from Kingston Town Centre. The Common supports an extensive area of wet heath and a variety of other acidic heath and grassland communities reflecting local variations in geology, drainage and management. These habitats support a number of plants, including some that are locally uncommon.

Wimbledon Common has been designated as a SAC because it supports an internationally important population of the Annex II species stag beetle *Lucanus cervus*. The Common also supports good examples of the following Annex I habitats:

- Northern Atlantic wet heath with *Erica tetralix*
- European dry heaths

¹ Annex II of Directive 92/43/EEC, amended by Directive 97/62/EC.

A condition assessment is available for the Site of Special Scientific Interest, which covers the same area as the SAC. Although this assessment is now out of date it does provide a useful indication of the issues that currently affect the site. The condition assessment table is presented in Appendix 2

1.4 Legislative Considerations

The Conservation (Natural Habitats, &c.) Regulations 1994, referred to in this report as the Habitats Regulations, make provision for implementing the EC Directive on the Conservation of Natural Habitats and Wild Fauna and Flora² in Great Britain (the Habitats Directive). The Regulations detail measures relating to the conservation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)³. These sites are known as European sites and form a European network known as Natura 2000. The Natura 2000 series of sites contains habitats and species which are rare, endangered or vulnerable in the European Community (in this report, these are referred to as European features⁴).

1.4.1 Favourable Condition

The Habitats Directive requires that the interest features, i.e. species and habitats, that occur on a European site should be maintained in favourable conservation status. To this end a number of objectives specific to the interest features have been identified for each European site. These include objectives relating to the maintenance of existing habitats, the monitoring of species distribution and abundance, and the assessment of potentially damaging activities.

Favourable Condition Tables (see Appendices 3 and 4), which have been produced for each European site, provide the mechanism for assessing the status of a site against the conservation objectives. It is also intended that these Tables should be used to define the scope and nature of any 'appropriate assessment' completed under the Habitats Regulations.

1.4.2 Requirement for the assessment of plans and projects

Planning Authorities have a statutory duty under Regulation 48 of the Habitats Regulations, to assess the implications of a plan or project on a European site. Examination of Regulation 48 shows that this is a two stage process.

Under Regulation 48(1)(a), the first stage is to assess whether or not the plan or project is likely to have a significant effect on a European site, either alone or in combination with other plans or projects. When carrying out this initial 'screening' assessment, it is necessary to determine if the a plan or project is directly connected with or necessary to the management of the site (Regulation 48(1)(b)). In other words, whether there are conservation benefits to be gained from authorising the plan or project.

If it is found to be the case that the plan or project is likely to have a significant effect on a European site, and that it is not directly connected with or necessary for the management of the site, the requirement for completing stage 2 is triggered. Stage 2 is set out at the end of Regulation 48(1), which states that, if the above conditions have been met, the competent authority (in this case the Planning Authority) shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

Following the European Court Judgement (ECJ Case C-6/04) of 20 October 2005, 'appropriate assessments' must now be prepared for land-use planning documents within the UK where these have implications for sites designated as a Special Protection Area, a Special Area of

² Directive 92/43/EEC, amended by Directive 97/62/EC.

³ Classified under the Wild Birds Directive 79/409/EEC.

⁴ These are the species and habitats for which a site has been designated as a SAC or SPA - not all of these will necessarily occur on all SSSIs making up each SAC/SPA.

Conservation or under Regulation 10 of the Habitat Regulations. This report sets out the stage 1 'screening' assessment of the AAP for Kingston town centre.

1.5 Approach

Guidance on the methodology for appropriate assessments is contained within PPS 9: "Biodiversity and Geological Conservation" and the accompanying Circular 06/2005: "Biodiversity and Geological Conservation – Statutory Obligations and their impact within the planning system". However, this advice predates the ECJ judgement and therefore reflects the application of the Habitats Directives to plans and projects as determined by the UK government rather than that required by the October 2005 judgement.

The Department for Communities and Local Government (DCLG) has recently published the draft guidance document "Planning for the Protection of European sites: Appropriate Assessment. Guidance for Regional Spatial Strategies and Local Development Documents" (August 2006). Whilst this draft guidance sets out a broad framework for the completion of appropriate assessments for land-use plans, it does not adequately address the 'screening' stage, the purpose of which is to determine the need for an appropriate assessment.

The EC publication "Assessment of plans and projects significantly affecting Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC" (November 2001) (updated January 2007) describes in detail the requirements of an appropriate assessment. However, this document also provides little detail on the 'screening' stage.

Nevertheless, both of the above references have been considered in this assessment. In addition, the following documents have also been referred to:

- Appropriate Assessment of Plans: Discussion Paper (June 2006) (Scott Wilson/Levett-Therivel Sustainability Consultants/ Treweek Environmental Consultants/Land Use Consultants)
- Draft Screening Report to assess the need for an Appropriate Assessment of the Surrey Heath Core Strategy 2006 – 2026 (January 2007)
- Draft Screening Report to assess the need for an Appropriate Assessment of the Wandsworth Council Core Strategy Development Plan Document

2 Potential Impact Mechanisms

2.1 Overview

A considerable amount of research has been carried out into the impacts of development, in particular housing, on urban heath sites in Dorset and the Thames Basin. Whilst the results of this research are not strictly applicable to Richmond Park SAC and Wimbledon Common SAC, they do provide a useful insight into the impacts that may arise from urban development.

A number of impact mechanisms have been identified whereby heathland sites may be affected, either directly or indirectly, by development (e.g. Morris, 1995; Haskins, 2000). These can be summarised as follows:

- Habitat loss (direct impact)
- Habitat fragmentation (direct impact)
- Species/vegetation removal (direct impact)
- Disruption of hydrology (both groundwater and flood storage) (direct impact)
- Soil erosion and siltation (direct or indirect impact)
- Soil leaching/acidification (direct impact)
- Eutrophication (direct or indirect impact)
- Pollution (water and air-borne) (direct or indirect impact)
- Soil compaction (direct impact)
- Physical disturbance (direct or indirect impact)
- Noise disturbance (direct or indirect impact)
- Predation (particularly by pets) (indirect impact)

Examination of these impact mechanisms reveals that they broadly fall into two different types: direct impacts arising during the construction phase of a development (e.g. habitat loss, pollution, disruption of hydrology); and indirect impacts arising from the occupation of a site (e.g. physical disturbance, predation).

As previously noted, the development of Kingston Town Centre will take place at least 1km from Richmond Park SAC and at least 3km from Wimbledon Common SAC. Consequently direct impacts on either of the sites are considered to be highly unlikely, and for this reason this report focuses exclusively on indirect impacts and their significance.

2.2 Assessing impact significance

This section determines the significance of the predicted ecological impacts arising from the proposed redevelopment of Kingston town centre. It does so by assessing the anticipated impacts for each key ecological feature in light of the available information. Professional judgement is used to determine whether the effects related to these are expected to be ecologically significant. This evaluation has been carried out with reference to guidance produced by the Institute of Ecology and Environmental Management⁵.

⁵ Institute of Ecology and Environmental Management (February 2006) Guidelines for Ecological Impact Assessment in the United Kingdom– Final Draft

2.2.1 Assessing likelihood

Where possible, levels of certainty are given to indicate the likelihood that both the predicted activity/impact and the associated ecological effect will occur. The IEEM guidance suggests using the following four-point scale to identify the levels of confidence arrived at by professional judgement:

- Certain/High
- Probable/Moderate
- Unlikely/Low
- Extremely unlikely/Negligible

2.2.2 Assessing magnitude

Within this report magnitude is taken to be the amount or level of the impact. This is often a subjective assessment, and for this reason the following broad terms have been adopted within this report:

- High
- Medium
- Low
- Negligible

2.2.3 Determining significance

IEEM guidance states that impacts should be determined as being significant when they have an adverse or positive effect "on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area".

2.2.3.1 Definition of integrity

A site can be regarded to have integrity (or 'favourable condition') when its ecological function remains whole, it continues to meet its conservation objectives, and it retains the ability to recover from disturbance and to evolve in ways favourable to conservation with a minimum of external management support (European Commission, 2001).

2.2.3.2 Definition of conservation status

The concept of 'conservation status' is used to determine the significance of ecological impacts on a habitat or species. This is defined in IEEM guidance as below:

- For habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area.
- For species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.

The conservation status of a habitat or species can be regarded to be favourable when the following criteria are met:

- The area of habitat is stable or increasing.
- The structure and functions of the habitat necessary for its long-term maintenance continue to exist.
- The population of a species is maintaining itself on a long-term basis.

- The range of a species is stable.
- There is sufficient habitat to maintain the population.

2.3 Indirect Impact Mechanisms

As previously noted, if the broad scope of development described within the AAP is realised, this will result in an increase in the number of local residents and an increase in the number of visitors to the town centre. Given the proximity of the town centre to Richmond Park SAC and Wimbledon Common SAC, it is possible that the re-development of the town centre could indirectly result in an impact on these sites through increased visitor pressure. However, in order to determine the significance of any impact it is also necessary to consider the likelihood of the impact occurring and the magnitude of the impact, if an impact should arise.

In this section each of the indirect impact mechanisms identified in Section 3.1 are evaluated with respect to their likelihood, magnitude and ultimately their significance. As both SAC sites are surrounded by urban development, there are a wide range of interlinking factors that currently contribute to the current condition of those sites. Consequently the evaluation described below is necessarily subjective but has, where possible, drawn upon research that has looked at the impact of urban development on wildlife sites.

2.3.1 Soil erosion

Soil erosion can occur as a result of increased recreational use of a site, particularly if access is focussed along existing footpaths, both designated and informal. Walking can progressively lead to the loss of vegetation, exposing the underlying soils. Erosion problems may be exacerbated by other forms of recreational activity, such as cycling or horse riding.

Richmond Park is only designated for stag beetle, which is dependent on the mature trees and deadwood that are present throughout the Park. Whilst increased visitor numbers may lead to increased erosion of habitats within the park, it is unlikely that any such effect would impact directly on the status of stag beetle.

Examination of aerial photographs of Richmond Park (www.earth.google.com) show that the main access to the Park from the south-west is via a road open to traffic. Within the adjacent open grassland habitats there are a large number of well-defined paths, which indicate regular use by visitors. Although there is no restriction as to how visitors access the Park, it is considered likely that most will utilise these well-established routes.

It is therefore concluded that there is a negligible likelihood that stag beetles will be affected by soil erosion that might arise as a result of increased visitor numbers to Richmond Park SAC. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on this species.

Wimbledon Common is also designated for stag beetle and, for the same reasons highlighted above, an impact on this species is considered unlikely. The Common is also designated for wet and dry heath, and these habitats may be affected by trampling from walkers or other recreational users. Excessive use of tracks or paths can lead to erosion of the fragile soils typically associated with heathland habitats.

Although increased erosion could occur at Wimbledon Common as a result of increased visitor pressure, the likelihood of this happening is considered to be low. The reason for this is two-fold: firstly, the Common is more than 3km from Kingston town centre and the two locations are separated by the A3 trunk road. The distance between the sites and the presence of a significant barrier is considered likely to deter many people from using the Common other than on an occasional basis.

Secondly, there are other alternative open spaces closer to the town centre, which are more likely to be used for recreation. Richmond Park is located about 1km away from the town centre, and the River Thames is located immediately to the west of the town centre.

Proposals for the town centre include improved recreational access to the Thames riverbank (Policy K13 in the AAP), and this is likely to divert a proportion of the public away from other open space areas, including the two SAC sites. Whilst it is difficult to predict the extent to which the public will utilise the riverbank compared to other open spaces, it is likely that it will have a mitigating effect on both Richmond Park and Wimbledon Common.

Surveys carried out at heathland sites in Dorset revealed that most visitors interviewed lived in close proximity to the site (Natural England Research Report 624). Of the visitors questioned:

- 56.1% walked to the heath
- 33.3% travelled by car to the heath
- 80% of the visitors who walked to the heath travelled less than 600m
- The median distance travelled by car was 2.2km
- Approximately 75% of the visitors spent between 31 and 60 minutes on the heath

Whilst the above data have been collected from urban heaths in Dorset, and may not therefore be directly applicable to the London sites, they do provide a useful indication of visitor behaviour. As previously noted, given that Wimbledon Common SAC is located more than 3km from Kingston town centre, and that the two sites are separated by the A3, it is considered unlikely that there will be a significant increase in visitor pressure as a direct result of the redevelopment of the town centre.

It is therefore concluded that there is a low likelihood that dry heath will be affected by soil erosion that might arise as a result of increased visitor numbers to Wimbledon Common SAC. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on this habitat.

2.3.2 Eutrophication

Heathland typically develops on impoverished and acidic soils, which are low in nutrients (Symes and Day, 2003). The acidic conditions mean that biological activity on the soil surface is low, with the result that leaves and other organic material is broken down slowly. As heathland is a nutrient-poor system, enrichment of the soils can impact on the vegetation present, allowing atypical species to develop.

Survey work carried out along paths on urban heath sites in Dorset, has revealed that some are becoming edged by strips of enriched grassland (Haskins, 2000). Within these strips typical heathland plant species are gradually becoming excluded. These habitat changes have been attributed to the use of the heaths for exercising dogs, which generally urinate or defecate within 1m of paths (Natural England Research Report 649).

According to the Pet Food Manufacturers' Association, in 2004 there were 6.1 million dogs in the UK, with 4.8 million households owning dogs. The UK population in 2004 was about 60 million, comprising approximately 24 million households (www.statistics.gov.uk). This equates to approximately 0.25 dogs per household: in other words, one in four households owns a dog.

Using the figures presented above it is possible to estimate the likely increase in dog ownership that could potentially arise from the proposed re-development of Kingston town centre. However, it should be noted that this is likely to be an over-estimate as it assumes that the current baseline level is zero and does not take into account the lower level of dog ownership that may occur in high density housing, particularly flats.

In the AAP it is stated that the broad scope of development envisaged by 2020 includes approximately 1000 residential units. If it is assumed that this equates to 1000 households, it is estimated that there will be an increase in the local dog population of approximately 250 animals, most of which will need exercising.

Surveys carried out at heathland sites in Dorset revealed that most visitors lived in close proximity to the site. Of the visitors questioned:

- 56.1% walked to the heath
- 33.3% travelled by car to the heath
- 80% of the visitors who walked to the heath travelled less than 600m
- The median distance travelled by car was 2.2km
- Approximately 75% of the visitors spent between 31 and 60 minutes on the heath

Whilst the above data have been collected from urban heaths in Dorset, and may not therefore be directly applicable to the London sites, they do provide a useful indication of visitor behaviour. The data appear to support the conclusion that the distance between Wimbledon Common SAC and Kingston town centre is likely to reduce any additional visitor pressure that may occur as a direct result of the redevelopment of the town centre.

It is concluded that there is a low likelihood that dry heath will be affected by eutrophication that might arise as a result of increased visitor numbers to Wimbledon Common SAC. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on this habitat.

By comparison Richmond Park, which is located approximately 1km from the town centre, is potentially within walking distance for residents of that area. However, the survey data collected for the Dorset heath sites suggest that people may be deterred from visiting this site because of the distance from the town centre.

When assessing the potential increase in visitor pressure on Richmond Park SAC, it should be noted that the River Thames is located within 500m of the town centre. This site would therefore appear to have the greatest potential for meeting the recreational needs of future residents of the town centre, particularly if work is carried out to improve access along the riverside (Policy K13 of the AAP).

If a precautionary approach is adopted, whereby increased visitor pressure is assumed to occur at Richmond Park SAC as a result of the proposed redevelopment, there could be increased enrichment of habitats adjacent to paths. However, this is not considered to be a significant effect with regards to the overall status of stag beetle within the Park. As previously noted, this species is associated with mature trees and dead wood, and for this reason any changes in species diversity and composition of habitats adjacent to paths is unlikely to be significant.

It is therefore concluded that there is a low likelihood that stag beetles will be affected by eutrophication that might arise as a result of increased visitor numbers to Richmond Park SAC. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on this species. The same conclusion also applies to the stag beetle population at Wimbledon Common.

2.3.3 Pollution (water and air-borne)

Richmond Park SAC and Wimbledon Common SAC are respectively about 1km and 3km from Kingston town centre, and for this reason it is considered highly unlikely that there is a hydrological link between the sites. This is reinforced by the fact that Kingston town centre has already been subject to extensive development in the past, as has the area between the town centre and the two SAC sites. This will have included the provision of foul and surface water

drainage infrastructure. For these reasons water-borne pollution is unlikely to affect either SAC site, and therefore has not been considered further within this report.

Air-borne pollution has been highlighted as an issue that is currently affecting habitats at both SAC sites (Paul Losse, Senior Specialist, Natural England pers. comm.). Of particular concern are pollutants that lead to changes in the species structure and composition of the habitats present.

In the AAP it is stated that the broad scope of development envisaged by 2020 includes retail, office, leisure and residential development. None of the proposed development is likely to provide a direct source of air-borne pollutants, which could potentially impact on habitats within Richmond Park SAC and Wimbledon Common SAC. Indirect impacts could occur as a result of increased car use associated with the proposed redevelopment of the town centre. However, the significance of this increase is difficult to predict for the following reasons.

Kingston town centre is currently a thriving metropolitan area, where a proportion of residents and visitors currently travel by car. This current level of car use is the baseline against which the proposed redevelopment will need to be measured. Consequently there will be off-setting of current car use by future residents and visitors who use cars. Although there will probably be an increase in the number of cars using the town centre following its redevelopment, the actual increase is likely to represent a small percentage of the total number of cars currently in the area.

It is concluded that there is a low likelihood that stag beetles at either Richmond Park SAC or Wimbledon Common SAC will be affected by air-borne pollution that might arise as a result of the proposed redevelopment of Kingston town centre. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on this species.

It is also concluded that there is a low likelihood that the wet and dry heath habitats at Wimbledon Common SAC will be affected by air-borne pollution that might arise as a result of the proposed redevelopment of Kingston town centre. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on these habitats.

2.3.4 *Physical disturbance*

Physical disturbance can occur in many different ways, ranging from the disturbance of species due to the proximity of people, to habitat destruction arising from deliberate acts of vandalism, including fires. For the purposes of this assessment, the impacts of disturbance at Richmond Park SAC and Wimbledon Common SAC relate specifically to the species and habitats that the sites are designated for, i.e. stag beetle, wet heath and dry heath.

Stag beetles may be affected by disturbance that directly affects their survival, such as crushing by cars, bicycles, walkers etc, or by disturbance that affects the habitat upon which they are dependent. As stag beetles are associated with mature trees and dead wood, the species is most likely to be affected by disturbance that impacts on these habitat features, such as deliberate fires.

It is understood that fires are infrequent within the Wimbledon Common SAC, with no fires recorded in the last three or four years (David Haldane, Site Manager, pers. comm.). When fires do occur it is rare for them to move into woodland sites, and therefore damage tends to be restricted to the heather and gorse. Both of these plants will recover quickly if the fire is wind assisted, but slow burning fires can burn deep into the litter and seed bank. No anecdotal evidence was available to indicate that any dead wood or mature trees have been lost to fire.

In Sections 3.3.1 and 3.3.2 research data collected at the Dorset heath sites has been used to assess the changes in visitor pressure that might arise as a result of the redevelopment of Kingston town centre. It is concluded that there is a low likelihood that visitor pressure will

increase significantly at Wimbledon Common SAC. As the level of disturbance that occurs at the SAC is likely to be directly proportional to the number of visitors, it is concluded that there will not be a significant increase in disturbance at the site as a result of the proposed redevelopment of Kingston town centre.

The proximity of Richmond Park SAC to Kingston town centre means that it is likely to experience a proportionately greater increase in visitor numbers than Wimbledon Common SAC as a result of the proposed redevelopment. This could potentially lead to an increased risk of disturbance of habitats used by stag beetles, the main disturbance mechanism likely to be deliberate fires.

It is understood that, on average, Richmond Park experiences 20 fires per annum (Adam Curtis, Site Manager, pers. comm.). The fires tend to be small ones, mostly camp fires or barbeques, but occasionally fires are set in some of the old hollow mature trees, and these can have a devastating effect on tree survival.

The type and extent of fires at both SAC sites is likely to be related to the habitats present, with dry heath being particularly susceptible. The citations for Richmond Park SAC and Wimbledon Common SAC show the main habitat types present to be as follows:

Richmond Park SAC:

Heath (25%)

Dry grassland (18%)

Improved grassland (20%)

Broad-leaved deciduous woodland (25%)

Wimbledon Common SAC:

Heath (5%)

Dry grassland (45%)

Improved grassland (3.5%)

Broad-leaved deciduous woodland (45%)

The above data show that the heath component is relatively small, with the result that any fire damage is likely to be more significant (in terms of the proportion of habitat affected).

It is extremely difficult to predict the likely incidence rate of deliberate fires that might arise as a result of the proposed re-development of Kingston town centre. One reason for this is that experience gained at heath sites in Dorset (Nick Squirrel, Conservation Officer, pers. comm.) indicate that such antisocial behaviour is often instigated by a small number of persistent offenders.

It is concluded that there is a low likelihood that stag beetles or their habitat at either Richmond Park SAC or Wimbledon Common SAC will be affected by an increase in deliberate fires that might arise as a result of the proposed redevelopment of Kingston town centre. The magnitude of any impact will be low, and this leads to the overall conclusion that there will not be a significant impact on this species.

2.3.5 Predation (particularly by pets)

Predation, particularly by cats, has been identified as being a serious issue at a number of heathland sites (Natural England Research Report 623). Dogs may also present a predation risk, although it is generally the case that they are taken to a site by owners etc for exercising, rather than ranging freely. The likelihood of dogs being taken to Richmond Park SAC and Wimbledon Common SAC has previously been considered in Sections 3.3.1 and 3.3.2.

Cats present a somewhat different risk, as they are often allowed to range freely. Consequently it is possible that cats may pose a predation risk to protected species if a wildlife site is located within their normal hunting range.

The significance of predation as an issue depends on a number of factors, such as the protected species present (and its susceptibility to predation) and the distance that cats have to travel to pose a risk. Data published by Natural England (Natural England Research Report 623) suggests that prey caught by cats comprises about 73% mammals, 22% birds, 3% herpetofauna and fish and 2% invertebrates by number. These data indicate that invertebrates make up a very small proportion of the total prey items, although this may reflect the relative availability of prey and the ease with which it can be caught.

Natural England (Research Report 623) report that the longest distance recorded for a cat travelling between two points is 1.5km in one study, with a mean of 1107m for 16 males and 806m for 8 females in another study (feral cats in Avonmouth Docks). Data on hunting ranges of domestic cats indicates that distances travelled can be very variable, and it is possible that ranges may be reduced in urban situations due to the presence of neighbouring cat territories, traffic etc.

Nevertheless, if the figures reported above are adopted for the purposes of this assessment, it can be seen that it is highly unlikely that cats will range as far as Wimbledon Common SAC from Kingston town centre. It is also considered unlikely that cats will range as far as Richmond Park SAC, the nearest point being more than 1km from the town centre. This places the Park at the limit of a domestic cats hunting range, which may be reduced further by the presence of a busy road network between the two sites.

It is concluded that there is a low likelihood that cats associated with any future redevelopment of Kingston town centre will range as far as Richmond Park SAC and Wimbledon Common SAC. The magnitude of any impact will therefore be negligible, and this leads to the overall conclusion that there will not be a significant impact on the stag beetle population at either site as a result of cat predation.

2.4 In combination assessment

Information provided by RB Kingston indicates that a number of other developments are currently taking place or are proposed in the wider area:

Under Construction

Kingston town centre – 200 flats currently under construction

Surbiton district centre – 60 flats currently under construction

New Malden area – 100 flats currently under construction

Proposed

Former Government Offices/Tesco site, Tolworth – 500 flats with/without a supermarket

Surbiton station car park – 200 flats

Three sites to the south and east of Kingston town centre – 150 flats in total

The potential impact of new residential units in Kingston town centre has previously been assessed with reference to the 1000 residential units proposed within the AAP. The principles of the previous assessment also apply to the 200 flats that are currently being constructed. In conclusion it is considered unlikely that the proposed development, either alone or in combination with other developments in the town centre, will have a significant impact on any of the European features at either SAC site. In summary, the reason for this relates to the distances that will have to be travelled to reach these sites, compared with other closer recreational facilities, such as the riverside area.

The current and proposed developments in Surbiton and Tolworth is located to the south of Kingston Upon Thames, and is consequently more than 2.5km from Richmond Park and more than 4km from Wimbledon Common. The increased separation distance between the sites, together with the presence of a number of key busy arterial roads, has led to the conclusion that the proposed development is unlikely to result in a significant increase in the number of visitors using the two SAC sites.

The current development at New Malden is estimated to be about 1.5km from both SAC sites, and is also separated from both sites by busy arterial roads. Although this development is closer than the other developments being considered, it is considered to be sufficiently far away to make it less attractive as a destination for many visitors.

2.5 Overall Conclusion

Whether considered alone or in-combination with other plans or projects, the Kingston town centre AAP will not result in development that is likely to have a significant effect on a European site. It is therefore concluded that an appropriate assessment will not be required under Regulation 48(1) of the Conservation (Natural Habitats &c.) Regulations, 1994. A summary of the assessment process is provided in Table 1 below.

Table 1 – Summary of screening assessment

European site	Qualifying features	Key environmental conditions necessary to meet conservation objectives	Possible impacts arising from AAP	Likely significant effect alone	Possible impacts arising from other current or proposed developments	Likely significant effect in combination
Richmond Park SAC	Stag beetle	This beetle develops in decaying timber, largely in the roots and stumps of dead deciduous trees, but also in other types of damp decaying wood in contact with soil. The main requirements are that the timber is moist and decaying and, usually, in contact with the soil.	Increased population leading to slight increase in visitor pressure. Partially mitigated by distance from site. Possible increased risk of fire.	No	Most development (current or proposed) is 2.5km or more from the site. 200 flats currently being constructed in town centre.	No
Wimbledon Common SAC	Stag beetle	This beetle develops in decaying timber, largely in the roots and stumps of dead deciduous trees, but also in other types of damp decaying wood in contact with soil. The main requirements are that the timber is moist and decaying and, usually, in contact with the soil.	Increased population leading to increased visitor pressure. Largely mitigated by distance from site (more than 3km).	No	Most development (current or proposed) is 4km or more from the site. 100 flats currently being constructed in New Malden.	
	European dry heath	Cover of <i>Calluna vulgaris</i> to be between 25% minimum and 90% maximum. Mosaic with >10% young and 30-50% mature / degenerate <i>Calluna vulgaris</i> within unit. < 25% <i>Ulex europaeus</i>	Increased population leading to increased visitor pressure. Largely mitigated by distance from site (more than 3km).	No	Most development (current or proposed) is 4km or more from the site. 100 flats currently being constructed in New Malden.	No
	Northern Atlantic wet heath	Scattered tussocks of <i>Molinia caerulea</i> but <50% cover. >20% ericoids and >10%* <i>Sphagnum</i> cover. Mosaic with <i>Calluna vulgaris</i> and <i>Erica tetralix</i> . < 30% <i>Ulex europaeus</i> in drier sites	Increased population leading to increased visitor pressure. Largely mitigated by distance from site (more than 3km).	No	Most development (current or proposed) is 4km or more from the site. 100 flats currently being constructed in New Malden.	No

3 References

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4 Appendix 1

Richmond Park SSSI condition assessment

Main habitat	Unit number	Unit area (ha)	Latest assessment date	Assessment description	Condition assessment comment	Reason for adverse condition
Acid grassland – lowland	1	114.67	21 Jun 2006	Unfavourable no change	Areas of acid grassland in this unit are assessed as unfavourable for the following reasons: Insufficient frequency of positive indicator species. Sward height is also outside the target range, indicating under grazing.	Undergrazing
Broadleaved, mixed and yew woodland – lowland	2	3.03	07 Feb 2003	Favourable	Mixed old plantation. Access restricted. Useful refuge area.	
Standing open water and canals	3	0.42	21 Mar 2006	Unfavourable recovering		
Acid grassland – lowland	4	153.18	21 Jun 2006	Unfavourable no change	Areas of acid grassland in this unit are assessed as unfavourable for the following reasons: Insufficient frequency of positive indicator species. Sward height is also outside the target range, indicating under grazing.	Undergrazing
Acid grassland – lowland	5	194.86	21 Jun 2006	Unfavourable no change	Areas of acid grassland in this unit are assessed as unfavourable for the following reasons: Insufficient frequency of positive indicator species. Sward height is also outside the target range, indicating under grazing.	Undergrazing
Broadleaved, mixed and yew woodland – lowland	6	29.34	29 Jun 2002	Unfavourable recovering	We have agreed Management Plan and WGS application is going ahead. Many years of neglect have lead to a dense shaded character. Thinning/coppicing, already underway will enhance habitat value.	
Broadleaved, mixed and yew woodland –	7	4.66	07 Feb 2003	Unfavourable recovering	Deadwood retained. Piles of cordwood and brash. Little ground flora. Some more thinning required.	

Main habitat	Unit number	Unit area (ha)	Latest assessment date	Assessment description	Condition assessment comment	Reason for adverse condition
lowland						
Standing open water and canals	8	10.35	28 Jun 2002	Unfavourable recovering		
Broadleaved, mixed and yew woodland – lowland	9	7.86	29 Jun 2002	Unfavourable recovering		
Acid grassland – lowland	10	205.12	21 Jun 2006	Unfavourable no change	Areas of acid grassland in this unit are assessed as unfavourable for the following reasons: Insufficient frequency of positive indicator species. Sward height is also outside the target range, indicating under grazing.	Deer grazing/browsing
Broadleaved, mixed and yew woodland – lowland	11	5.82	29 Jun 2002	Favourable	Fenced oak birch woodland. Several veterans. Dense growth. Shading in places.	
Broadleaved, mixed and yew woodland – lowland	12	22.52	29 Jun 2002	Favourable		
Acid grassland – lowland	13	57.27	21 Jun 2006	Unfavourable no change	Areas of acid grassland in this unit are assessed as unfavourable for the following reasons: Insufficient frequency of positive indicator species. Sward height is also outside the target range, indicating under grazing.	Undergrazing
Broadleaved, mixed and yew woodland – lowland	14	18.75	29 Jun 2002	Favourable	Unenclosed woodland. Small areas of over mature timber and veteran sweet chestnut and pollard oak. Some lying dead wood	

Main habitat	Unit number	Unit area (ha)	Latest assessment date	Assessment description	Condition assessment comment	Reason for adverse condition
Broadleaved, mixed and yew woodland – lowland	15	18.76	07 Feb 2003	Unfavourable recovering	This old plantation is recovering with deadwood now remaining on site. Some bracken clearance evident in glades.	

5 Appendix 2

Wimbledon Common SSSI condition assessment

Main habitat	Unit number	Unit area (ha)	Latest assessment date	Assessment description	Condition assessment comment	Reason for adverse condition
Dwarf shrub heath - lowland	1	58.06	09 Nov 2005	Unfavourable recovering	removal of encroaching scrub commenced. Heathland restoration by scarification undertaken summer 2005. Heather cuttings to be removed after cutting	
Acid grassland - lowland	2	127.47	09 Nov 2005	Unfavourable recovering		
Standing open water and canals	3	3.88	20 Nov 2003	Unfavourable declining	Kingsmere: no marginal vegetation. Rushmere: v. poor, no marginal vegetation. Bluegate Pond. V. little standing water. Good marginal vegetation incl. sphagnum. Queensmere: No marginal vegetation.	Public access/disturbance
Broadleaved, mixed and yew woodland - lowland	6	44.07	20 Nov 2003	Favourable	Woodland has a good uneven aged structure with no alien species. Ground flora not assessed due to time of visit. Little evidence of oak regeneration except in open areas where scrub is encroaching grassland areas. Ride widening and some thinning may help to further improve age structure	
Dwarf shrub heath - lowland	7	4.88	04 Apr 2006	Unfavourable recovering		
Broadleaved, mixed and yew woodland - lowland	8	95.40	05 Jan 2003	Favourable	Rides and paths being maintained. Coppicing not yet started.	
Dwarf shrub heath - lowland	9	17.62	04 Apr 2006	Unfavourable recovering		

6 Appendix 3

Richmond Park SAC citation

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pSAC: Richmond Park
Component SSSI: Richmond Park SSSI

Conservation objectives for the European interest on the SSSI

The conservation objectives for the European interest on the SSSI are:

to maintain*, in favourable condition, the habitats for the population of:

Stag beetle (*Lucanus cervus*)

* maintenance implies restoration if the feature is not currently in favourable condition.

The conservation objectives for the Richmond Park proposed Special Area of Conservation are, in accordance with para C 10 of PPG 9, the reasons for which the pSAC was proposed.

Favourable Condition Table for Richmond Park SSSI

The Favourable Condition Table will be used by Natural England and other relevant authorities to determine if a site is in favourable condition. Favourable condition is achieved when the targets given below are met.

The favourable condition table should inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations, but an appropriate assessment will also require consideration of issues specific to the individual plan or project. The favourable condition table does not by itself provide a comprehensive basis on which to assess plans and projects as required under Regulations 20-21, 24, 48-50 and 54 - 85. The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England will advise on a case by case basis.

Following an appropriate assessment, competent authorities are required to ascertain the effect on the integrity of the site. The integrity of the site is defined in para C10 of PPG9 as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified. The determination of favourable condition is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan or project being initiated and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan or project may have an adverse effect upon integrity even though the site remains in favourable condition.

(Targets relate to those relevant areas highlighted in the maps of the Management Plan),

Operational feature	Criteria feature	Attribute	Measure	Target	Comments
Semi-natural woodland	Stag beetle <i>Lucanus cervus</i>	Population size of species	Number of individuals.	None can be given other than confirmation of the continuing presence of the species breeding on the site.	No method has yet been found to relate results of a sampling method for this species to population size. Research is under way using colonization of specially constructed habitat piles.
		Number of old broadleaved trees.	Absolute number of large old trees (dbh >80cm) including standing dead trees and stumps.	An absolute minimum target should be the maintenance of the existing numbers of old trees but, in most sites, a decade-on-decade <u>increase</u> in the number of individual trees in these size categories, should be aimed at for the foreseeable future.	A large number of individual old trees is probably necessary to ensure that a proportion of them are likely to be in suitable condition to support sub-populations of the species.

		Population structure of broadleaved trees.	Distribution of trees across age categories from seedling/saplings to ancient trees, standing dead trees, fallen trees and stumps.	A distribution of individuals across all age classes which will ensure a continuity of a similar age distribution into the future, with no gaps in numbers in any particular size class and a relatively high proportion of older trees.	Natural regeneration and species successional dynamics means that this target needs to be applied over a wider area than single stands of trees, but within contiguous stands within which the species is likely to disperse and colonize.
		Condition of old broadleaved trees - state of decay.	Number of large individuals with signs of internal decay and hollowing.	A significant proportion (?% to be determined) of live trees with external fungal fruiting bodies, decay/wood-mould cavities and obvious hollowing.	A pragmatic minimum of 30 such trees in a 10 ha block of woodland should be regarded as favourable.
		Quantity and size of fallen broadleaved dead wood.	Overall volume of fallen timber and the relative size of individual pieces of dead timber.	<i>Information is not available to express this in terms of volume per unit area, but could be considered favourable when fallen dead wood is classed as average to good.</i>	40-60 m ³ ha ⁻¹ of fallen timber. A preponderance of such timber (?30%) should be large (at least 30cm + in diameter). It is particularly important that trunks and branches are not cut up as this increases the surface area/volume ratio and increases damaging fluctuations in temperature and humidity. <i>Good: 1 or 2 large fallen trees or trunks (>50cm dia) visible, plenty 5-50cm pieces in view (from any location). Average: 1 or 2 large pieces, little smaller material; or only smaller material (5-50cm) in view (from any location). Poor: even small material (5-50cm) scarce. Absent: nothing >15cm in diameter.</i>
		Position and degree of exposure of old broadleaved trees and stumps.	Proportion of old trees and stumps exposed to extremes of desiccation and very cool summer conditions (high proportion of either = unfavourable).	Information is not available to express this in terms of proportions. However, a majority of old trees and stumps and fallen timber should be humid, but not wet, and in warm conditions, though not continually exposed all-day to direct sunshine in summer.	Relative position/degree of exposure may change as a result of windthrow and forestry operations. Excessively dry conditions or very cool exposed ord deep shady conditions may prevent use of microhabitat by beetle.

		Condition and position of available dead timber	Proportion of timber that is moist, but not soggy and in contact with humid but not sodden soil and in particular not exposed to continual sunshine and desiccation.	Decay cavities low down in living trees, tree stumps and decaying tree roots in situ are important for the species.	Planned research may elucidate more precise targets and methodology. Until then, a pragmatic observations indicate that a majority of old trees and stumps should be in relatively warm humidity pockets.
<p>General</p> <p>This beetle develops in decaying timber, largely in the roots and stumps of dead deciduous trees, but also sometimes in other types of damp decaying wood in contact with soil such as fallen logs, roots of smaller bushy species, including garden shrubs, bases of fence posts, old timber piles etc. It is frequent in urban gardens and parks as well as in woodland within the core of its range in southern England.</p> <p>The main requirements are that the timber is moist and decaying and, usually, in contact with the soil. The People's Trust for Endangered Species have undertaken a nationwide survey of the species and found that it largely favours alluvial and sandy soils and appears to avoid clays and chalk. This research is continuing and they have produced survey and habitat management advice leaflets which can be obtained from their London Office or from EN's Enquiry Service.</p> <p>Currently the only site attributes that we understand that the species needs are related to the abundance and condition of decaying timber in which they develop. There may be other features important to adults about which we do not currently know, for example sap sources and flight lines.</p>					

7 Appendix 4

Wimbledon Common SAC citation



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SAC: Wimbledon Common Component SSSI: Wimbledon Common

Conservation objectives for the European interest on the SSSI

The conservation objectives for the European interest on the SSSI are

to maintain*, in favourable condition, the:

- 👉 European dry heath
- 👉 Northern Atlantic wet heath with *Erica tetralix*

to maintain*, in favourable condition, the habitats for the population of:

- 👉 Stag beetle (*Lucanus cervus*)

* maintenance implies restoration if the feature is not currently in favourable condition.

The conservation objectives for the Wimbledon Common possible Special Area of Conservation are, in accordance with para C 10 of PPG 9, the reasons for which the pSAC was proposed.

Favourable Condition Table for Wimbledon Common SSSI

The Favourable Condition Table will be used by Natural England and other relevant authorities to determine if a site is in favourable condition. Favourable condition is achieved when the targets given below are met.

The favourable condition table should inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations, but an appropriate assessment will also require consideration of issues specific to the individual plan or project. The favourable condition table does not by itself provide a comprehensive basis on which to assess plans and projects as required under Regulations 20-21, 24, 48-50 and 54 - 85. The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England will advise on a case by case basis.

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Operational feature	Criteria feature	Attribute	Measure	Target	Comments
Semi-natural woodland	Stag beetle <i>Lucanus cervus</i>	Population size of species	Number of individuals.	None can be given other than confirmation of the continuing presence of the species breeding on the site.	No method has yet been found to relate results of a sampling method for this species to population size. Research is under way using colonization of specially constructed habitat piles.
		Number of old broadleaved trees.	Absolute number of large old trees (dbh >80cm) including standing dead trees and stumps.	An absolute minimum target should be the maintenance of the existing numbers of old trees but, in most sites, a decade-on-decade <u>increase</u> in the number of individual trees in these size categories, should be aimed at for the foreseeable future.	A large number of individual old trees is probably necessary to ensure that a proportion of them are likely to be in suitable condition to support sub-populations of the species.

		Population structure of broadleaved trees.	Distribution of trees across age categories from seedling/saplings to ancient trees, standing dead trees, fallen trees and stumps.	A distribution of individuals across all age classes which will ensure a continuity of a similar age distribution into the future, with no gaps in numbers in any particular size class and a relatively high proportion of older trees.	Natural regeneration and species successional dynamics means that this target needs to be applied over a wider area than single stands of trees, but within contiguous stands within which the species is likely to disperse and colonize.
		Condition of old broadleaved trees - state of decay.	Number of large individuals with signs of internal decay and hollowing.	A significant proportion (?% to be determined) of live trees with external fungal fruiting bodies, decay/wood-mould cavities and obvious hollowing.	A pragmatic minimum of 30 such trees in a 10 ha block of woodland should be regarded as favourable.
		Quantity and size of fallen broadleaved dead wood.	Overall volume of fallen timber and the relative size of individual pieces of dead timber.	<i>Information is not available to express this in terms of volume per unit area, but could be considered favourable when fallen dead wood is classed as average to good.</i>	40-60 m ³ ha ⁻¹ of fallen timber. A preponderance of such timber (?30%) should be large (at least 30cm + in diameter). It is particularly important that trunks and branches are not cut up as this increases the surface area/volume ratio and increases damaging fluctuations in temperature and humidity. <i>Good: 1 or 2 large fallen trees or trunks (>50cm dia) visible, plenty 5-50cm pieces in view (from any location). Average: 1 or 2 large pieces, little smaller material; or only smaller material (5-50cm) in view (from any location). Poor: even small material (5-50cm) scarce. Absent: nothing >15cm in diameter.</i>

		<p>Position and degree of exposure of old broadleaved trees and stumps. Condition and position of available dead timber</p>	<p>Proportion of old trees and stumps exposed to extremes of desiccation and very cool summer conditions (high proportion of either = <u>unfavourable</u>).</p> <p>Proportion of timber that is moist, but not soggy and in contact with humid but not sodden soil and in particular not exposed to continual sunshine and desiccation.</p>	<p>Information is not available to express this in terms of proportions. However, a majority of old trees and stumps and fallen timber should be humid, but not wet, and in warm conditions, though not continually exposed all-day to direct sunshine in summer.</p> <p>Decay cavities low down in living trees, tree stumps and decaying tree roots in situ are important for the species.</p>	<p>Relative position/degree of exposure may change as a result of windthrow and forestry operations.</p> <p>Excessively dry conditions or very cool exposed or deep shady conditions may prevent use of microhabitat by beetle.</p> <p>Planned research may elucidate more precise targets and methodology. Until then, a pragmatic observations indicate that a majority of old trees and stumps should be in relatively warm humidity pockets.</p>
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General
 This beetle develops in decaying timber, largely in the roots and stumps of dead deciduous trees, but also sometimes in other types of damp decaying wood in contact with soil such as fallen logs, roots of smaller bushy species, including garden shrubs, bases of fence posts, old timber piles etc. It is frequent in urban gardens and parks as well as in woodland within the core of its range in southern England.

The main requirements are that the timber is moist and decaying and, usually, in contact with the soil. The People’s Trust for Endangered Species have undertaken a nationwide survey of the species and found that it largely favours alluvial and sandy soils and appears to avoid clays and chalk. This research is continuing and they have produced survey and habitat management advice leaflets which can be obtained from their London Office or from EN’s Enquiry Service.

Currently the only site attributes that we understand that the species needs are related to the abundance and condition of decaying timber in which they develop. There may be other features important to adults about which we do not currently know, for example sap sources and flight lines.

Dry heathland	H1	Extent	Total area (ha) mapped in relation to a site specific baseline to be determined (ie. first available map/aerial photograph of interest feature when/after notified). Measure every two years if it is possible.	Maintain existing area on its current sites	<p>This community is confined to base-poor and oligotrophic sandy soils in the more continental lowlands of Eastern England.</p> <p>Large areas have been lost or fragmented to agriculture and forestry in the past.</p> <p>Estimated existing area is ??ha. This must be determined through survey in summer 2001. Use aerial photos of 1948 to map extent of heath near to time of original notification.</p>
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		Bare ground	<p>'Natural' bare ground (mineral soil) in intimate mosaic within vegetation</p> <p>'Recreation' heavily used paralleling paths</p>	<p>'Natural' between 10-25%</p> <p>'Heavily disturbed' <1%</p>	<p>Bryophytes and lichens are more extensive and diverse among open covers of <i>Calluna</i>.</p>
		Vegetation Structure	Record percentage of cover of <i>Calluna vulgaris</i> in different stages of its life cycle.	<p>Cover of <i>Calluna vulgaris</i> to be between 25% minimum and 90% maximum.</p> <p>Mosaic with >10% young and 30-50% mature / degenerate <i>Calluna vulgaris</i> within unit.</p> <p>< 25% <i>Ulex europaeus</i></p>	<p><i>Calluna vulgaris</i> is often the only woody species present. Its cover and height are very variable.</p> <p>Grasses, when they occur, are present as scattered tussocks.</p> <p><i>Ulex europaeus</i> is uncommon and restricted to disturbed areas.</p> <p>In the absence of grazing a mowing regime should create a mosaic of different age heather.</p>

		Vegetation Composition	Record frequency of any of the following species when present: List A <i>Calluna vulgaris</i> List B <i>Agrostis capillaris</i> , <i>Festuca ovina</i> , <i>Deschampsia flexuosa</i>	Species from List A must be at least frequent. At least two species of list B are at least occasional	Associated flora is for the most part confined to areas between <i>Calluna</i> clumps and the center of collapsing bushes.
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		Negative indicators	Record frequency and percentage cover of any of the following species when present: <i>Pteridium aquilinum</i> <i>Rhododendron ponticum</i> <i>Rubus</i> spp. <i>Senecio</i> spp. <i>Urtica dioica</i> <i>Pinus</i> spp. <i>Betula</i> spp. <i>Quercus</i> spp. <i>Cirsium arvense</i> <i>Cirsium vulgare</i>	< 50 % cover degenerate/dead <i>Calluna vulgaris</i> No <i>Rhododendron ponticum</i> < 1 % <i>Rubus</i> spp., <i>Senecio</i> spp., <i>Urtica dioica</i> , <i>Cirsium</i> spp. < 5% trees, tree seedlings or other species of scrub. < 25% <i>Pteridium aquilinum</i>	<i>Rhododendron ponticum</i> and <i>Gaultheria shallon</i> can spread rapidly and have a negligible nature conservation value. Dense rhododendron casts deep shade which excludes other vegetation. Scrub (shrubs, trees or tree seedlings) above 1 m in height is an important component of the heathland but its cover should be stable or not increasing as a whole. Management of bracken should be directed more to control than eradication.
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			Record presence of signs of overgrazing, e.g. carpet, topiary or drumstick heather forms	No presence of signs of overgrazing.	Although lowland heathlands tend to be more under-grazed than over-grazed, localized overgrazing may occur. Management may need to be modified to tackle these situations.
Wet heathland	M16 mires	Extent	Total area (ha) mapped in relation to a site specific baseline to be determined (ie. first available map/aerial photograph of interest feature when/after notified). Measure every two years if it is possible.	Maintain existing area on its current sites	M16 is characteristic of the drier south and east. Estimated existing area is ??ha. This must be determined through survey in summer 2001. Use aerial photos of 1948 to map extent of heath near to time of original notification.

		Bare ground	'Natural' bare ground (mineral soil) in intimate mosaic within vegetation 'Heavily disturbed' stock poached, eroded or heavily used paralleling paths	'Natural' between 1-5% 'Heavily disturbed' <1%	M16 is characteristic of acid, oligotrophic peats.
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		Vegetation Structure	Record percentage cover of <i>Molinia caerulea</i> tussocks	Scattered tussocks of <i>Molinia caerulea</i> but <50% cover	M16 presents variable mixtures of <i>Erica tetralix</i> , <i>Calluna vulgaris</i> , <i>Molinia caerulea</i> in open, low stands, with a ground cover of bryophytes and lichens.
			Record percentage cover of <i>Sphagnum</i> spp.	>20% ericoids and >10%* <i>Sphagnum</i> cover	Grazing, burning and water regime may transform the appearance of particular stands and produce greater structural diversity.
			Record percentage cover of <i>Calluna vulgaris</i> and <i>Erica tetralix</i> .	Mosaic with <i>Calluna vulgaris</i> and <i>Erica tetralix</i> . < 30% <i>Ulex europaeus</i> in drier sites	*Presence of <i>Sphagnum</i> to be determined in survey summer 2001, and subsequently target for percentage to be decided.

		Negative indicators	Record percentage cover of any of the following species when present: <i>Salix cinerea</i> <i>Betula pubescens</i> <i>Pinus</i> spp. <i>Alnus glutinosa</i>	< 5% cover trees, tree seedlings or other species of scrub.	Light grazing or occasional burning may help maintain the vegetation by setting back any invasion of woody plants. Uncontrolled burning or grazing, on the other hand, impoverishes vegetation.
			Record presence of drains and erosion.	No artificial drains or grips with active nick point / headward erosion into peat and gravel.	Drainage and erosion will produce a loss of the feature area.