17 REFERENCES

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18 APPENDICES

Appendix A: Project Specification

PURPOSE

To conduct a peer review of the English Nature Delivery Project/Plan, testing and strengthening the evidence base underpinning it.

OBJECTIVES

- To assist Government in informing the South East Plan Examination in Public's consideration of issues pertaining to the Thames Basin Heaths.

- To help ensure the delivery of much-needed housing in the area surrounding the Thames Basin Heaths in the immediate (0-5 years), medium (5-10 years) and longer (10-20 years) terms, by identifying practicable approaches to delivery within the requirements of the Directive whilst also supporting heathland conservation, ground nesting bird interests, and the continued use of heathland areas for recreational purposes.

SCOPE OF THE PEER REVIEW

The work will comprehensively review the evidence underpinning all three prongs of the Delivery Plan: Site Management, Site Access and Land Mitigation. Specifically it will consider:

- the view expressed in the Delivery Plan that development within 5km of any part of the SPA is likely to have a significant impact, and therefore require mitigating measures;
- the zones which determine the amount of mitigation required for proposed development within 400m, 2km and 5km of the SPA;
- whether the 16 and 8 ha greenspace land mitigation standards are at the most appropriate level;
- whether there could be more flexibility in applying the standards depending on accessibility of the SPA from the proposed development;
- different approaches to site management that might be more suitable for the Thames Basin Heaths;
- different approaches to site access control that might be more suitable for the Thames Basin Heaths;
- what combination(s) of measures (alternative green space/access control/site management/others) might best enable us to comply with the Directive in the medium to long term;
- what combination of approaches could be adopted in the immediate short term (i.e. the next 12 months) to allow development in accordance with the Directive, *before* substantial quantities of potential mitigating land is likely to come on-stream and;
- what further research could be undertaken to enhance the evidence base and indication of the time it would take to undertake it.

Appendix B: Project management and Steering Group

The project Steering Group members and affiliation were as listed in Table B.1.

Table B.1: Project Steering Group membership

Member	Affiliation
Nick Dexter (Chair)	DCLG
Lesley Creedon	GOSE
Moira Gibson	Surrey Heath BC
Winnie Kuta-Dankwa	DCLG
Craig Lee	Defra
Kyle Lischak	English Nature
Nick Littlewood	DCLG
David Payne (substitute: Martin Tugwell)	SEERA
David Wilkes	DCLG

The Steering Group met three times as follows:

Inception Meeting – 20th July 2006

Interim Meeting – 8th September 2006

Final Meeting – 26th September 2006

Appendix C: The stakeholder workshops

C.1 Introduction

Two workshops were held for stakeholders. The first was for the Project Steering Group and organisations with a focus on site conservation and management. It was held in London on the 8th September 2006. The second was for planning authorities and developers. It was held in Guildford on 14th September 2006.

At each workshop delegates were invited to put forward alternative ideas or improvements to English Nature's Delivery Plan. This was in a 'brainstorming' format where ideas were proposed and recorded but not immediately evaluated. Invitees were informed that the ideas would not be attributed to individuals or their organisations. Such ideas were then assessed against the two key criteria of:

i. The need to deliver housing supply.
ii. To comply with the EU Directives that require the protection of the SPA.

A third, but lesser requirement, was to allow continued recreational use of the heaths.

Following the evaluation the ideas were assessed and prioritised for further consideration by the consultancy team.

Those attending the stakeholder workshop on 8th September 2006 were from the following organisations:

BBOWT

Countryside Agency

DCLG [member of the Project Steering Group]

English Nature [member of the Project Steering Group]

English Partnerships

Forestry Commission

GOSE [member of the Project Steering Group]

H & IoW WT

MoD

RSPB

SEERA [member of the Project Steering Group]

Surrey County Council

Surrey Heath Borough Council [member of the Project Steering Group]

Surrey WT

The ideas identified for further consideration were grouped by issue type, as follows:

Visitor management

- Assessment of recreation pressure on SSSIs/SPA
- Reduce numbers of footpaths
- Regulate open access under CROW Act
- Close entrance points, car parks and roads.
- SPA-wide integrated strategy for visitor management

Control of dog walking

- Byelaws
- Control of dog walking on CROW Act open access land
- Control of dogs on public rights of way
- Dog walkers on SPA should be required to clean up after their dogs. Dog walkers on alternative open space should not in order to encourage use.

Raise public awareness and education

- Provide rangers to inform and educate.

Identification of SANGS

- A more creative approach should be taken to identifying SANGS. LUC study provides good starting point but is largely limited to land in public ownership.
- Encourage use of developers' land banks
- More cooperation between LPAs and developers in providing integrated approach to housing and open space provision.
- Land for strategic green space should be identified in development plans.
- There should be more linkage between LPA housing capacity and green space studies
- Need for cross boundary cooperation between LPAs.

Large strategic SANGS

- Provide large attractive SANGS sites with visitor facilities to attract existing users of the SPA and create capacity for new users.

Delivery of SANGS

- Use of Compulsory Purchase
- Government to fund strategic open space provision with subsequent recovery of costs through payments from developers.
- Local Delivery Vehicle needed to provide strategic open space (examples are Ashford, Thames Gateway and Cambridge)

Existing open space

- Identify new or upgraded existing open space which already provides capacity for new recreational use

Regional Planning

- Treat SPA as a sub-region to allow integrated planning

Release of sites for development in the short-term.

- Could development be permitted in the short term provided there was provision for mitigation in the medium term.

Heathland management and reinstatement

- Remove forestry plantations to create additional heathland habitat for Annex I birds.
- Improve heathland management to increase numbers of Annex I birds.
- Reinstate grazing of heaths.
- Seek contributions from developers for heathland management.

Those attending the stakeholder workshop on 14th September were from the following organisations:

Barton Wilmore

Berkshire Joint Strategic Planning Unit

Bracknell Forest District Council

DCLG [member of the Project Steering Group]

English Nature [member of the Project Steering Group]

Flavia Estates

Home Builders Federation

Guildford Borough Council

GOSE [member of the Project Steering Group]

Hart District Council

Lacey Simmons Homes

Millgate Homes

Rectory Homes

Runnymede Borough Council

Rushmoor Borough Council

SEERA [member of the Project Steering Group]

Surrey County Council

Surrey Heath Borough Council

Wokingham Borough Council

The ideas identified for further consideration were, grouped by issue type, as follows:

Visitor management

- Control visitor access during the bird breeding season
- Direct visitors away from bird breeding area
- Create new waymarked footpaths
- Close some rights of way
- Close car parks, restrict parking on roads
- Close some roads
- Reduce number of informal access points
- Improve management of country parks and other focus points within the SPA to attract visitors and reduce access elsewhere in the SPA
- Take into account the variation in attractiveness across the SPA to visitors
- Charge for access to the SPA
- Provide public transport to other sites
- Use CROW Act to restrict access
- Use warning notices (e.g. 'Beware of Adders') to deter visitors from sensitive areas.

Control of dog walking

- Restrict use for dog walking during the bird breeding season
- Introduce penalties for dog ownership e.g. local dog licencing, with income to be used for SPA visitor management
- Charge for access to SPA by dog walkers
- Use CROW Act to restrict dog walking

Raise public awareness and education

- Provide rangers
- Provide site information on SPA
- Raise awareness of the effect of cats on Annex I birds
- Promote other leisure opportunities in the area
- Cease promotion of public access to the SPA
- Cease promotion of wildlife watching within the SPA

Other adverse effects

- Other adverse effects of residential development, such as fires and fly-tipping, should be taken into account

Identification of SANGS

- There should be a strategic approach to identification of SANGS across the area affected. The SEERA/LUC study should be used as starting point.
- MoD/Defence Estates should review requirements for training land and release surplus land for SANGS.

Delivery of SANGS

- Provide incentives for LPAs with opportunities for SANGS to make land available for mitigation of development in other districts
- Facilitate financing of cross boundary SANGS provision
- Provide framework for joint working between LPAs
- Establish a body similar to an Urban Development Corporation to acquire land for SANGS and collect developer contributions.
- Provide CPO powers for SANGS acquisition
- Requirement for mitigation should not be based on zones but should be more widely funded.

Existing open space

- Consider effects of alternative recreation areas on requirements for mitigation

Development Zones

- Base on travel distance not straight line
- Consider effects of barriers such as major roads, railways and canal on zones
- Take into account MoD land with no public access

Regional Planning

- There should be one SPA-wide planning authority

Release of sites for development in the short-term.

- Enable developers to pay into a fund to be used for future mitigation which may not have been identified at the time of consent
- Grant some consents in advance of SANGS provision accepting that there may some limited effects.

Heathland management and reinstatement

- Enable developers to contribute to cost of SPA improvements.
- Improve management of habitat across the SPA to increase bird populations.
- Control predators such as crows and foxes
- Reinstate grazing of heaths.
- Increase heathland habitat outside SPA

Management of bird populations

- Provide secure refuge areas in areas of high quality habitat within SPA to maintain bird populations

Features of residential development

- Covenants restricting pet ownership
- Flats rather than houses
- Retirement homes
- Does replacement of business uses with residential development result in an increase in recreational pressure
- Reductions in household size and lifestyle changes should be taken into account
- Developments with no on-site parking, with no opportunities for other parking in the vicinity, would preclude car ownership and thus access to the SPA

Legislative change, interpretation and administration

- Demonstration of no likely significant effect/no adverse effect on integrity in the context of the precautionary principle is too restrictive. Objectors should be required to demonstrate that an adverse effect was likely.
- Revise SPA boundaries
- Establish an independent authority to review English Nature advice regarding likelihood of adverse effects on SPA. This should take into account the need to balance need for housing and nature conservation.
- Natural England should be required to have regard to economic factors in providing advice.
- Every case should be considered on its merits, not be subject to a 'blanket' objection
- Extend period of determination of planning decisions to enable full consideration
- Ensure awareness of potential similar issues which may arise with respect to other designated sites or species

Research

- Review English Nature evidence base
- Carry out research to confirm the likely actual increase in recreational use of the SPA as a result of new housing provision
- Carry out research to confirm whether levels of housing proposed will actually have adverse impacts
- Differentiate between the effects of new housing development from other factors.
- Confirm need for any mitigation or controls on housing

Appendix D: Review of ecological evidence underpinning the draft Delivery Plan

D1 Introduction

D1.1.1 This Appendix to the report reviews the evidence upon which English Nature's assessment of the likely effects of recreational use of the SPA on the important bird species is based. It also considers other relevant research.

D2 English Nature's evidence base

D2.1 Method

D2.1.1 RPS has reviewed the publications and reports referenced in the Delivery Plan and its Appendix 6 that concerned the Annex 1 species (listed at the end of this Appendix). The objective of the review was to test how the information contained in each document is used in the Delivery Plan or Appendix 6. The review followed a systematic method, asking in turn a series of questions:

- Are the main conclusions of the document, relevant to the Delivery Plan, based on a robust scientific method, analysis and test of statistical significance?
- Is the information contained in the document quoted accurately in the Delivery Plan or Appendix 6?
- Does the Delivery Plan or Appendix 6 make full use of the information in the document or are there omissions that provide additional support for the Delivery Plan or contradictory evidence?
- Is there other, robust evidence available in the scientific literature that provides additional support for the Delivery Plan or contradictory evidence that would have been available to the authors of the Delivery Plan or Appendix 6?
- Has evidence become available more recently that provides additional support for the Delivery Plan or contradictory evidence?

D2.2 Overview

D2.2.1 Appendix 6 sets out the evidence base for disturbance effects on each of the three Annex 1 species in turn (Nightjar, Woodlark and Dartford Warbler) and then summarises research on human access patterns to heathlands in southern England. For transparency, this review follows this system.

D2.2.2 Appendix 6 includes details on aspects of species ecology such as identification criteria and also some historical and contextual information, some of which is included within the Delivery Plan. As this does not form part of the evidence base of disturbance effects on the Annex 1 species at the Thames Basin Heaths, these

details (and the publications and reports they derive from) are not incorporated into this review.

D2.2.3 It should be noted in the first instance that a large proportion of the key studies cited in the evidence base in Appendix 6 and the Delivery Plan have only recently been conducted. This means that they have not been published in the peer reviewed literature. It is understood that they have been subject to review by senior scientific staff from within the organisations managing and/or funding the research. Most studies are expected to be published in academic peer reviewed journals and it has been reported that the key findings have not been altered following the submission process (R Langston, RSPB, *pers. comm.*).

D3 Nightjar

D3.1 Are the main conclusions based on a robust scientific method, analysis and test of statistical significance?

D3.1.1 Nightjars are crepuscular and nocturnal, foraging mostly around dusk and dawn. This very nature of their ecology provides challenges for those undertaking research work on the ecology of the species.

D3.1.2 Recent work undertaken by the RSPB detailed in Appendix 6 and the Delivery Plan have involved cold searching for Nightjar nests in order to determine nest success and potential causes of disturbance (Murison, 2002; Woodfield & Langston, 2004b). The 2002 study involved analysing the success of 47 Nightjar nests (a realistic sample size for such a cryptic and time consuming bird to locate) and assessed them against factors of the levels of disturbance at each heathland site (primarily limited to location of footpaths, access points etc). Whilst it appears that nest success was in some way determined by habitat and location of footpaths, it is stated that the causal link between nest failure (through predation) and human use of footpaths remains unproven. It should also be noted that while an inverse relationship was observed between the number of successful nests and the level of urban development surrounding a site (derived from postcode data), this result was not found to be significant at the 5% level. While 63% of the nest failures recorded were thought to be caused by avian predation (most likely to be by corvids), no work was undertaken to record numbers of predators at each site. Despite other sources available in the literature (e.g. Taylor, 2002) suggesting that corvid abundance is correlated to counts of people on sites in Dorset, the Delivery Plan's statement that there appears to be a link between this and Nightjar nest success must remain precautionary.

D3.1.3 The use of postcode data as a representation of the level of urbanisation has its limitations. This data indicates the number of buildings in an area and not a population density. Clarke et al, (2005) (which is the sole source for the information given in the 'Access Patterns' section of Appendix 6) found no statistically significant correlations between either the total number of visitors or visitor groups and the number of houses within any fixed distance. Therefore the link between human disturbance and nightjar breeding success that is proposed in

Murison (2002) and inferred in Liley and Clarke (2003) should be treated as being unproven.

D3.1.4 The 2004 (Woodfield & Langston) study was designed to establish the causal mechanism behind reduced nest success at high access sites and investigate the possible relationships between recreational access and predation. This study could therefore be seen to address the shortcomings of the 2002 work. During this work 29 nests were located and of these 10 were observed with nest cameras. This low sample size for the camera work was presumably limited by expense. Although one observed flushing of a nightjar (by an unidentified source) resulted in the predation of eggs by a Carrion Crow, the very limited number of nests observed and the small number of overall flushing observations (12) make it impossible to analyse robustly. The estimated flush rate of 12.2% per day calculated should also therefore be treated with caution.

D3.1.5 Indeed it is stated in the report that the overall low sample size of all nests observed is likely to have been a major factor in reducing the statistical power of the analysis. Trends in the data suggested that disturbance and vegetation have an influence on nightjar breeding success at high use heaths, but these were not statistically significant at the 5% level.

D3.2 Is the information quoted accurately in the Delivery Plan or Appendix 6?

D3.2.1 Appendix 6 discusses details of the Nightjar's general ecology. It states that they have been seen to travel up to 8km from their nest sites each night to feed in invertebrate rich habitats. Alexander & Cresswell's (1990) radiotracking study on Dorset heaths actually showed that the maximum distance recorded by birds was 5.8km, although it is possible. due to the limitations in the radiotracking technique, that birds went further. The mean distance from the nesting area to the final site visited was 3.1km.

D3.2.2 When discussing the most recent national nightjar survey undertaken by the British Trust for Ornithology, Appendix 6 discusses a decline in numbers from 1992 levels in Scotland and northern England. In fact, a decline occurred in Scotland only, while a small increase of 5% was seen in northern England (from 292 to 307 territorial males). Appendix 6 may however have used preliminary results from this study (although this is not stated) as the results were not fully published until July 2005 (Conway et al, 2005) and are further discussed below in this review.

D3.3 Does the Delivery Plan or Appendix 6 make full use of the information in the document or are their omissions that provide additional support or contradictory evidence?

D3.3.1 Appendix 6 notes that dogs were identified as flushing adult nightjars on two occasions in the 2004 study of Nightjars (Woodfield & Langston, 2004b). However, this is not qualified by stating that these events did not impact on nest success and both nests produced fledged young. Other evidence that goes some way to contradict the statements in Appendix 6 are the observations in the same report, that dogs were present with 94% of people recorded in transects but only 12% of these were recorded off a footpath.

D3.3.2 The home range estimate given in Appendix 6 of up to 8km given in Appendix 6 (although a maximum of 5.8km was noted in Alexander & Cresswell, 1990) is likely to be influenced by particular site characteristics. The study by Bowden & Green (1991) also incorporated radiotracking of nightjars, though the study site was Thetford Forest rather than the Dorset heaths. The long distance movements recorded by Alexander & Cresswell were not seen in this work and it is stated that such movements could only have been infrequent. In fact all movements were within 2km of the nest site and most were within 1km. There was also a tendency for female birds to move further than males, with males spending most of their time within 200m of the centre of the territory. In addition, females were found to be absent from the nest site for a mean of 80 minutes per day that further supports the radiotracking observations of limited long range movements to adjacent foraging areas.

D3.3.3 It is apparent that the presence of preferred foraging habitat close to a young plantation or heathland compartment influences whether a nightjar holds territory in it or not. Although the effect of urbanisation in the near vicinity to nightjar territories is highlighted in depth in Appendix 6, the link between this and the presence or lack of surrounding young plantation (Bowden & Green, 1991) or deciduous woodland and wetland areas (Alexander & Cresswell, 1990) which nightjars were shown to preferentially select to forage is not discussed.

D3.4 Is there other, robust evidence available in the scientific literature that provides additional support for the Delivery Plan or contradictory evidence that would have been available to the authors of the Delivery Plan or Appendix 6?

D3.4.1 A notable omission in the literature cited as supporting evidence in Appendix 6 and the Delivery Plan is the work by Liley and Clarke (2002) that assessed the effect on the density of Annex 1 bird species by urban development. This works reports a lower density of nightjars at sites with a greater extent of urbanised surrounding land but indicated no significant relationship between territory density and restricted versus open access sites. Nightjar nests were located significantly further away from houses than were random points, and thus confirming the evidence quoted by Murison (2002) in Appendix 6.

D3.4.2 There are additional factors which may cause a reduction in nightjar densities on more urbanised heaths such as increased predator pressure and risk of fire. Woodfield and Langston (2004a) indicates that effects would be less on large heaths due to the smaller edge effects, yet the relationship of territory density and urban development has been seen to be independent from heathland size.

D3.4.3 The influence of levels on human access on heaths in relation to predator pressure and particularly corvid abundance is therefore worthy of further discussion than is made in Appendix 6. Although the Delivery Plan states that Murison's (2002) study appeared to show a strong link between site disturbance and increased predator pressure (such as corvids) no assessment of predator numbers at each site were made. However, supporting evidence for this is given in Taylor (2002) who reports a positive correlation between counts of visitors to Dorset heathland sites and populations of corvids.

D3.4.4 Additional supporting evidence is available that indicates that nightjars are deleteriously affected by increased fragmentation of breeding sites. Bullock and Webb (1995) found that smaller and more isolated heaths in Dorset had higher extinction rates and lower colonisation rates for characteristic animals and plants. This included Nightjars that were negatively correlated with a fragmentation index. Hagemeijer & Blair (1997) discuss Nightjar population trends over a wider European scale. There is no obvious link between the general decline and climatic factors and it is proposed that habitat changes provide the most impact. Nightjars remain common only in the less intensively farmed east and south of Europe where prey is likely to be more readily available and breeding habitat less disturbed.

D3.4.5 A study of a North Yorkshire population of nightjar (Rebbeck et al, 2001) used vocal recognition to identify individual nightjars. It is suggested that this may allow improved coverage of assessments of nightjar territories due to the expensive and labour intensive nature of radiotracking work. However, estimation of home range size remains difficult using this technique although worthy of note is the 500m and 1 km mid seasons shift in territories for individual birds in this study. This further confirms the observations that Nightjar movement is dependant on individual site characteristics.

D3.5 Has evidence become available more recently that provides additional support for the Delivery Plan or contradictory evidence?

D3.5.1 The 2004 national nightjar survey (Conway et al, 2005) identifies a 34% increase in nightjar numbers from 1992 levels. Much of this increase is assigned to effective habitat management of typical sites (e.g. Burgess, Evans & Sorensen, 1990). It is perhaps worthy of mention, that this increase has occurred while urbanisation and likely increases to the level of access to heathlands have continued.

D4 Woodlark

D4.1 Are the main conclusions based on a robust scientific method, analysis and test of statistical significance?

D4.1.1 Aside from details on the species general ecology and recent population increase (Sitters, 1986; Bowden, 1990; Wotton and Gillings, 2000) which rely on basic but robust techniques and analysis, the discussion on the effect of disturbance on Woodlark is based solely on work by John Mallord, set out in his PhD thesis. This thesis reports the results of research on a Dorset population of Woodlarks carried out from 2002 to 2004. The thesis incorporates two individual papers that are of relevance to the evidence base. These are:

i. Predicting the consequences of recreational disturbance for a woodlark *Lullula arborea* population on heathlands in southern England.

ii. The role of urban development, recreational disturbance and isolation in determining the distribution and abundance of woodlarks *Lullula arborea*.

D4.1.2 For the first paper on predicting the consequences of recreational disturbance, fieldwork was undertaken in 2002 and 2003 at 16 heathland sites in Dorset (although 12 sites were covered in 2002). A relatively low sample size of nests was located (14 and 28 in the two years respectively). Recreational disturbance was measured at the site level by transect routes and within a site at territory level by focal watches.

D4.1.3 Mallord presents a model of the potential effects of disturbance on the productivity of woodlarks that leads to the result that if there was no disturbance on any of the sites, then 34% more woodlark chicks would be raised. This model makes several assumptions in addition to the unlikely scenario of no disturbance at all occurring on a particular site. Firstly it assumes that habitat quality would be equal on all sites and that birds would be expected to settle equally on all available habitat. It should also be stated in Appendix 6 that although the model shows a predicted increase in productivity when disturbance is removed, that there is no significant difference between the actual and predicted means.

D4.1.4 The second part of Mallord's work investigated the distribution and abundance of woodlarks at 39 Dorset heathland sites. As Appendix 6 notes this study uses a similar approach to the work on Nightjars (Liley & Clarke, 2003) in relation to investigating the amount of urban development surrounding a heathland site. However, to improve the methodology for Woodlarks, Mallord related Woodlark density to the area of suitable habitat as this differs substantially from the requirements of Nightjars. The proportion of sites occupied by Woodlarks declined with higher levels of urbanisation, while increasing with a greater number of additional Woodlarks within 4 km (proposed as an indicator of site isolation).

D4.2 Is the information quoted accurately in the Delivery Plan or Appendix 6?

D4.2.1 The general information on Woodlark population and ecology in Appendix 6 is quoted accurately. It is however worth noting that Bowden (1990) gives a Woodlark home range as being rarely less than 3ha, while Appendix 6 gives a minimum home range requirement of 5ha. Appendix 6 also suggests that in optimum habitats territories may only be 1.5ha – 2ha, although this may in fact refer to the more densely packed Iberian and south European populations (Hagemeijer & Blair 1997).

D4.2.2 Appendix 6 and consequently the Delivery Plan draw on the Mallord PhD, stating that the density of Woodlarks within a site correlated to disturbance levels, with lower densities where disturbance levels were higher. Also, within sites, the probability that a territory would be occupied declined with increasing levels of disturbance. They did not indicate what were the 'disturbance' factors specifically involved and the extent that this included recreational access in its different forms. They reported that Mallord used the same approach to that used for Nightjars to assess the impact of the level of urban development surrounding a site and found a relationship for number of sites occupied by woodlarks to decline with the percentage level of urbanisation. They did not state if this analysis used postcode data and therefore the same precautions should apply if using this as a direct indication of recreational disturbance as noted for Nightjars above.

D4.2.3 Appendix 6 of the Delivery plan quotes the result of Mallord's study that there was no effect of disturbance on nest survival. More precise details that are of note are that in addition to the level of disturbance, neither the distance of the nest to the nearest footpath nor the interaction between disturbance and path distance had a significant effect on nest survival.

D4.2.4 Appendix 6 makes reference to the Mallord model output that if there were no disturbance on any of the sites, then 34% more woodlark chicks would be raised. It should be noted, but it is not in Appendix 6, that although the model indicates this predicted increase in productivity when disturbance is removed, that there is no significant difference between the actual and predicted means.

D4.3 Does the Delivery Plan or Appendix 6 make full use of the information in the document or are their omissions that provide additional support or contradictory evidence?

D4.3.1 Mallord investigates and reports on the consequences of six different disturbance scenarios on woodlark population sizes. This is omitted from Appendix 6 of the Delivery Plan. This considered scenarios that reflected the range of possible outcomes from a change in access, including that resulting from the implementation of open access under the CRoW Act. This ranged from increases in access on all sites to levels associated with the busiest site in the study through to not allowing any access on the sites. The results of this model provided interesting although extremely wide ranging results. Opening up of all sites to public access and increasing levels of disturbance predicted large reductions in population size, whereas redistributing current levels of disturbance actually resulted in a large increase. Removal of disturbance from all sites was predicted to result in a 13 - 48% increase in population size.

D4.3.2 The scenario of maintaining current disturbance levels on open sites and modelling levels on currently closed sites to the mean levels of open sites (predicted to be the most likely scenario resulting from implementation of the CRoW Act by Mallord) predicts no effect on the woodlark population. Overall it is thought that increases in recreational access may have some negative impact on woodlark populations but very substantial increases would be necessary to show any effect. Mallord reports that even a doubling of recreational use under the scenario of current access arrangements would have a negligible effect on population size. It is only when that doubling in numbers is unmanaged, such that it is assumed spread out across the heathland that a reduction in woodlark population is predicted.

D4.3.3 It is clear from this model that management of visitors in terms of their distribution may have implications for the productivity and distribution of Woodlarks on heathland, which is something that is not touched upon in Appendix 6 or the Delivery Plan. Indeed Mallord, goes as far as suggesting that it is possible that greater access may help "foster an appreciation by the public for the need for wildlife conservation". It is also noted that woodlarks respond readily to the provision of new habitat such as clearfell and as such, suitable habitat could be provided as part of mitigation at particular sites, if appropriately located and managed.

D4.3.4 Appendix 6 refers to the finding that density of woodlarks decreases with urbanisation but it omits the finding on the relationship with the proportion of occupied sites. Appendix 6 states that urban development operates in increasing site isolation, although Mallord found only a weak correlation between these two factors and it is suggested that they are acting independently. There is a significant link however, between urbanisation, levels of recreational disturbance (via transects surveys of visitors) and woodlark density. The relationship between urbanisation and recreational disturbance remained unproven in Liley & Clarke (2003).

D4.3.5 The importance of off-site areas (i.e. away from heathland such as arable land) is touched upon in Appendix 6. Although it is only based upon anecdotal evidence, Mallord states that when woodlarks return to their breeding sites in early spring they spend a large proportion of their time in these off-site areas. There is therefore some suggestion that suitable foraging areas away from heathland are of some importance to woodlarks. This landscape context remains the critical conclusion of this aspect of the study in that should any new habitat be created for woodlarks it should not only be in less urban areas but also close to established woodlark populations and also suitable arable foraging sites.

D4.3.6 It should be noted that these results have yet to be published in a peer reviewed academic journal and as such should be treated with some caution.

D4.4 Is there other, robust evidence available in the scientific literature that provides additional support for the Delivery Plan or contradictory evidence that would have been available to the authors of the Delivery Plan or Appendix 6?

D4.4.1 An omission to the literature used as supporting evidence is the work by Liley and Clarke (2003) as referred to for Nightjar above. In this study it is reported that woodlarks show lower territory density on open access heaths when compared to restricted access sites and so supporting the Mallord work quoted in Appendix 6 and the Delivery Plan. However, no significant relationship was found between woodlark territory density and the amount of developed land surrounding the heath, contradicting the results shown by Mallord.

D4.4.2 Taylor (2002) looked at predation on woodlark nests both actual and artificial. For the real nests 42% were predated, though no relationship was found between predation and disturbance or between predation and predator abundance. 69% of artificial nests were predated, and of those where the cause could be assigned, 53% were by corvids. A significant relationship existed between the predation and access levels. There was also a similar relationship between corvid numbers and human activity. These conflicting results could both provide support and contradict the evidence given in Appendix 6 and the Delivery Plan.

D4.4.3 Although climate was considered a minor factor in Sitters (1986), Hagemeijer & Blair (1997) suggest that it may play some importance in the population fluctuations in the wider European scale. Northerly populations of woodlarks have a tendency to move south to mix with southern populations. Population fluctuations, as seen with recent increases in England (Wotton and Gillings, 2000), have also been noted

in Sweden, The Netherlands and Germany. It is suggested that successive mild winters may induce west European populations to winter closer to their breeding areas, rendering them vulnerable to a severe winter.

D4.5 Has evidence become available more recently that provides additional support for the Delivery Plan or contradictory evidence?

D4.5.1 It should be noted that a national survey of this species has been undertaken in the 2006 breeding season by the British Trust for Ornithology and updated population sizes and distribution will be reported in due course.

D.5 Dartford Warbler

D5.1 Are the main conclusions based on a robust scientific method, analysis and test of statistical significance?

D5.1.1 The limited information on the effects of human disturbance and urban development on Dartford Warblers is based on ongoing PhD research which has yet to be published and was not available for review. The preliminary results attributed to this study should therefore be treated with caution and could not be reviewed in terms of their robustness or statistical significance.

D5.1.2 The statement that Dartford Warblers are less likely to nest on smaller or more isolated heath patches is supported by longstanding peer reviewed studies such as Bibby (1979b), where larger heaths were found to hold disproportionately more territories.

D5.2 Is the information quoted accurately in the Delivery Plan or Appendix 6?

D5.2.1 As noted above the main source of information of the effects of disturbance and urbanisation on Dartford Warblers was not available for review. All other information on the species ecology and habitat preference is quoted accurately in Appendix 6. Appendix 6 details the importance of both heather and gorse within each Dartford Warbler territory, however the Delivery Plan lists only gorse as important for nesting and foraging. Bibby (1979a) found that heather was the preferred nest site, even in territories where there was sufficient gorse, while Bibby & Tubbs (1975) and Robins & Bibby (1985) reported several territories without gorse present but none where heather was absent. Catchpole & Phillips (1992) found a strong correlation between territory size and area of heather (but not with gorse).

D5.3 Does the Delivery Plan or Appendix 6 make full use of the information in the document or are their omissions that provide additional support or contradictory evidence?

D5.3.1 As noted above the main source of information of the effects of disturbance and urbanisation on Dartford Warblers was not available for review. As the main evidence regarding disturbance effects is currently unpublished in any form it should be treated with due caution.

D5.4 Is there other, robust evidence available in the scientific literature that provides additional support for the Delivery Plan or contradictory evidence that would have been available to the authors of the Delivery Plan or Appendix 6?

D5.4.1 The preliminary PhD research results on Dorset Dartford Warblers suggest that birds are less likely to nest if the heathland patch was near land heavily used by humans. The study by Liley & Clarke (2002) goes some way to contradict this, as they found no significant correlation between the density of Dartford warblers and the percentage of developed land within 500m of the heathland patch. In addition no significant difference was identified in the number of territories on sites with open access versus restricted access.

D5.4.2 Another study not cited in Appendix 6 or the Delivery Plan provides additional support to the preliminary evidence referred to. Van den Berg et al (2001) compared the number of Dartford warbler territories on heathland in 1994 with vegetation and land use parameters. A negative effect of fragmentation (isolation and area of heath), proximity of woodland, urban areas and intensive agriculture was found on Dartford Warbler territory numbers. This study therefore suggested that the species showed selection for heaths away from urban centres, and possibly with less visitor pressure. In contrast to earlier work it was also found that pine and birch scrub had some importance, although it should be noted that Dartford Warbler's have increased dramatically in population size since previous studies. It is proposed that the species is now occupying sub-optimal habitat. The effects (breeding success; susceptibility to disturbance/predation) this has on such birds is currently unknown.

D5.4.3 The possible effect of roads on Dartford Warbler populations is only briefly discussed. The evidence of an effect is relatively anecdotal at present (Bibby, 1979a; Catchpole & Phillips, 1992; Treweek et al., 1998). It was discovered in the 1992 work that territories containing more gorse are often located near roads and these territories are in turn those that often held adults that 'disappeared'. Gorse is well known to occur where there has been soil disturbance, such as along road boundary banks. Two adults were picked up dead on a road in the 1992 work, while a single bird was found in the 1979 study. A full and robust study of road mortality effects on Dartford Warblers would be beneficial but is unlikely to be feasible short of experimentally closing roads on several sites.

D5.5 Has evidence become available more recently that provides additional support for the Delivery Plan or contradictory evidence?

D5.5.1 It should be noted that a national survey of this species has been undertaken in the 2006 breeding season by the British Trust for Ornithology and updated population sizes and distribution will be reported in due course.

D6 Conclusions

D6.1 Overview

D6.1.1 The most significant conclusion of this review is that the statistical robustness of the relationships between measures of access pressure and bird populations are only weak. This in part arises inevitably from the difficulty of obtaining a good sample size in the short time periods over which the studies were conducted. However, there is not the contrary evidence from the weak statistical relationships or other studies to be able to dismiss the need to take a precautionary approach to the application of the evidence.

D6.2 Nightjar

D6.2.1 It is difficult to study Nightjar breeding success because of their cryptic nesting behaviour. This means that sample sizes in the key studies that investigated the relationship between access and nest location and success was small. This in turn makes the probability of deriving statistically significant results less likely.

D6.2.2 A causal link between nest failure (through predation) and human use of footpaths remains unproven.

D6.2.3 The relationship between access measures and bird population measures in Murison 2002 was not statistically significant.

D6.2.4 No significant relationship between territory density and restricted versus open access sites was identified in a study that was not quoted in the Delivery Plan (Liley and Clarke 2002).

D6.2.5 Nightjar nests were located significantly further away from houses than were random points in a study that was not quoted in the Delivery Plan (Liley and Clarke 2002).

D6.2.6 The link between human disturbance and nightjar breeding success that is proposed in Murison (2002) and inferred in Liley and Clarke (2003) should be treated as being unproven.

D6.2.7 The two nests that were proven to have had the adult flushed off by a dog (Woodfield & Langston, 2004b) both fledged young successfully.

D6.3 Woodlark

D6.3.1 It is difficult to study Woodlark breeding success because of their cryptic nesting behaviour. This means that the sample size in the key study (Mallord 2005) that investigated the relationship between access and nests location and success was small. This in turn makes the probability of deriving statistically significant results less likely.

D6.3.2 Mallord found that the proportion of sites occupied by Woodlarks declined with higher levels of urbanisation.

D6.3.3 Mallord found that there was no significant effect of access on nest survival, the distance of the nest to the nearest footpath or the interaction between them.

D6.3.4 Mallord produced a model that related access patterns to Woodlark populations. This predicted, but not referred to in the Delivery Plan or Appendix 6, that to create a significant effect on Woodlark population visitor numbers would have to double and be unmanaged such that they spread across the heathland. Managing that doubling of visitors, such that it occurs along existing access routes and areas, predicted no significant impact on the Woodlark population. A scenario in the model that redistributed current levels of disturbance resulted in a large increase in the Woodlark population.

D6.3.5 A study by Liley and Clarke (2003) that was not referred to, reported that Woodlarks show lower territory density on open access heaths when compared to restricted access sites. This supports the work of Mallord. However, no significant relationship was found between woodlark territory density and the amount of developed land surrounding the heath, contradicting the results shown by Mallord.

D6.4 Dartford Warbler

D6.4.1 The main source of information on the effects of disturbance and urbanisation on Dartford Warblers was not available for review since it is ongoing research for a PhD that has not been written up. As the main evidence regarding disturbance effects is currently unpublished in any form it should be treated with due caution.

D6.4.2 The preliminary research results suggest that birds are less likely to nest if the heathland patch was near land heavily used by humans. The study by Liley and Clarke (2002) goes some way to contradict this, as they found no significant correlation between the density of Dartford Warblers and the percentage of developed land within 500m of the heathland patch. However, the preliminary research is supported by a published study (Van den Berg *et al* 2001) that found a negative effect of proximity to urban areas on Dartford Warbler territory numbers.

D6.4.3 There is little discussion of the effects of roads on this species, the potential for collision mortality and how this could rise as a result of increased residential population in the area.

D7 The documented evidence base

D7.1.1 The documents that were reviewed from the Delivery Plan are listed in Table D.1 and from its Appendix 6 in Table D.2. Note that some documents were not reviewed because it was considered that they were only used in the Delivery Plan to provide contextual or historic information rather than evidence. These documents are listed in Table D.3.

D7.1.2 Note also that one significant piece of evidence could not be assessed. This was the research conducted by Giselle Murison, a postgraduate student at the University of East Anglia, into Dartford warbler. This could not be reviewed because the research has not yet been written up as a thesis.

Table D.1: Publications and reports reviewed – draft Delivery Plan

Author	Year	Title	Publisher
Liley D and Clarke R.T.	2002	Urban development adjacent to heathland sites in Dorset: the effect on the density and settlement patterns of Annex 1 bird species.	EN Research Report 463, Peterborough
Liley D	2005	A summary of the evidence base for disturbance effects to Annex 1 bird species on the Thames Basin Heaths, and research on human access patterns to heathlands in southern England.	Footprint Ecology, Dorset.
Mallord, J.W.	2005	Predicting the consequences of human disturbance, urbanisation and fragmentation for a woodlark *Lullula arborea* population.	School of Biological Sciences. Norwich, UEA. PhD.
Murison G.	2002	The impact of human disturbance on the breeding success of nightjar *Caprimulgus europaeus* on heathlands in south Dorset, England	EN Research Report 483, Peterborough
Taylor K, Anderson P, Taylor R, Longden K, Fisher P	2005	Dogs, access and nature conservation.	EN Research Report 649, Peterborough.
Underhill-Day	2005	A literature review of urban effects on lowland heaths and their wildlife.	EN Research Report 623, Peterborough
Woodfield E, and Langston, R.	2004	Literature review on the impact of bird populations of disturbance due to human access on foot.	RSPB Research Report No.9, Sandy.

Table D.2: Publications and reports reviewed – Appendix 6

Author	Year	Title	Publisher
Alexander, I. and B. Cresswell	1990	Foraging by Nightjars *Caprimulgus europaeus* away from their nesting areas.	Ibis 132: 568-574.
Bibby, C. J.	1979	Breeding biology of the Dartford warbler *Sylvia undata* in England.	Ibis 121: 41-52.
Bibby, C. J.	1979	Conservation of the Dartford Warbler on English lowland heaths: A review.	Biological Conservation 13: 299 - 307.
Bowden, C. and R. Hoblyn	1990	The Increasing Importance of Restocked Conifer Plantations for Woodlarks in Britain: Implications and Consequences.	RSPB Conservation Review 4: 26-31.
Bowden, C. G. R.	1990	Nightjar habitat requirements - preliminary results from radio tracking in Thetford Forest.	Heathlands Conference II. Harrow House, Dorset, RSPB
Bowden, C. G. R.	1990	Selection of foraging habitats by Woodlarks (*Lullula arborea*) nesting in pine plantations.	Journal of Applied Ecology 27: 410-419.
Bowden, C. G. R. and R. E. Green	1991	The ecology of nightjars on pine plantations in Thetford Forest.	Unpublished RSPB report.
Burgess, N. D., C. E. Evans, and J. Sorensen	1989	Management case study: The Management of heathland for Nightjars at Minsmere, Suffolk.	Sandy, RSPB.
Catchpole, C. K. and J. F. Phillips	1992	Territory quality and reproductive success in the Dartford warbler *Sylvia undata* in Dorset, England.	Biological Conservation 61: 209 - 215.
Cresswell, B.	1996	Nightjars - some aspects of their behaviour and conservation.	British Wildlife 7: 297-304.
Liley, D. and R. T. Clarke	2003	The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England.	Biological Conservation 114: 219-230.

Author	Year	Title	Publisher
Mallord, J. W.	2005	Predicting the consequences of human disturbance, urbanisation and fragmentation for a woodlark *Lullula arborea* population.	School of Biological Sciences. Norwich, UEA. PhD.
Morris, A., D. Burges, *et al.*	1994	The status and distribution of Nightjars *Caprimulgus europaeus* in Britain in 1992. A report to the British Trust for Ornithology	Bird Study 41: 181-191.
Murison, G.	2002	The impact of human disturbance on the breeding success of nightjar *Caprimulgus europaeus* on heathlands in south Dorset, England.	English Nature RR 483
Robins, M. and C. J. Bibby	1985	Dartford Warblers in 1984 Britain.	British Birds 78: 269-280.
Sitters, H. P.	1986	Woodlarks in Britain, 1968-83.	British Birds 79: 105-116.
Tubbs, C. R.	1963	The significance of the New Forest to the status of the Dartford warbler in England.	British Birds 56: 41-49.
Woodfield, E. and R. H. Langston	2004	A study of the effects on breeding nightjars of access on foot to heathland.	RSPB Research Report 11. RSPB Sandy.
Wotton, S. R. and S. Gillings	2000	The status of breeding Woodlarks *Lullula arborea* in Britain in 1997.	Bird Study 47: 212-224.

Table D.3: Publications and reports that were not reviewed

Author	Year	Title	Publisher
Cramp, S. and K. Simmons	1977 – 1995	Birds of the Western Palaearctic.	Oxford, Oxford University Press.
DoE	1994a	UK Biodiversity Action Plan.	HMSO, London
Gibbons, D. W., J. B. Reid, *et al.*	1993	The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991.	London, T & AD Poyser.
Gregory, R. D. *et al.*	2002	The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002 - 2007.	British Birds 95: 410 – 448.
Holloway, S.	1996	The Historical Atlas of Breeding Birds in Britain and Ireland 1875-1900.	London, T&AD Poyser.
Lack, P., (ed)	1986	The Atlas of Wintering Birds in Britain and Ireland.	Calton, Staffs., T&AD Poyser.
Moore, N. W.	1962	The heaths of Dorset and their conservation.	Journal of Ecology 60: 369-91.
Sharrock, J. T. R., (ed)	1976	The Atlas of Breeding Birds in Britain and Ireland.	Tring, BTO.
Tubbs, C. R.	1997	The ecology of pastoralism in the New Forest.	British Wildlife 9: 7-16.
Witherby, H. F. *et al.*	1938	The handbook of British Birds.	London, Witherby.

Appendix E: Review of recreation evidence underpinning the draft Delivery Plan

E1 Introduction

E1.1.1 This section of the report reviews the evidence base upon which English Nature's assessment of the likely patterns of recreational use of the Thames Basin Heath SPA, as a consequence of new residential developments on the surrounding area, is based. It includes an examination of the evidence used relating to catchment area, the recreation type and the relative attraction of the land concerned. This section also considers what other relevant research exists. This review informs the consideration of English Nature's proposed zoning and mitigation standards in later sections of this report.

E2 English Nature's evidence base

The evidence referenced within the Delivery Plan draws principally on two sources. In both instances the quantum of evidence is considered to be relatively light.

E2.1 Standards

E2.1.1 The two evidence sources referenced are firstly the results and data from visitor surveys, and secondly standards of provision for recreational space. In the case of the latter the Delivery Plan identified three models for the formulation of standards, namely the Six Acre Standard produced by the National Playing Fields Association (NPFA undated), the Greater London Authority's own guide to preparing open space strategies (GLA 2005) and English Nature's own Accessible Natural Green Space Standards (ANGSt) (Harrison et al 1995, Handley et al 2003). All three are utilised to a greater or lesser degree in the calculation of the amount of recreational space that should be made available to the subject populations, usually those predicted for new development proposals. The Delivery Plan rightly acknowledges that all three guidelines have objectives and make assumptions that are not easily transferred to the SPA. In particular, the NPFA model concentrates on the provision of more formal recreational areas, such as playing fields and children's play spaces, whilst the GLA guidance examines only, as one would expect, open space provision within London, an area that provides unique challenges and circumstances not repeated elsewhere in the UK. The third, English Nature's own ANGSt model, whilst again identifying open space for its recreational role, aims to provide natural green space as the resource by which to fulfil that recreational demand.

E2.1.2 The relevance of each of these guides to the provision of appropriate recreational provision therefore varies at the outset due to their particular subject area or, more so, subject matter. The NPFA standard, widely understood and still utilised albeit to a decreasing degree by many planning authorities, is of little direct relevance to the considerations that exist in the Thames Basin Heaths SPA area.

The standard is compliant in its application only to the provision of 'outdoor playing space' and defines such space as that which is safely accessible and available to the general public, and of a suitable size and nature, for sport, active recreation or children's play. It is not the same as public open space, and does not encompass much of the space listed within Annex 2 of PPG17 (ODPM 2002a). To that extent, its relevance to the Delivery Plan is unclear, a point further emphasised by the standard being almost 70 years old. However, its age provides a clue to its continued application, namely that, in assessing the catchment areas of recreational land, its identification of underlying distances and times are key to the judgement of accessibility. Whilst not acknowledged in the Delivery Plan, it is this calculation that underpins its recommendations.

E2.1.3 The GLA study is also questioned by the Delivery Plan because of its age, the guidelines produced based on data over 40 years old. Standards were set on the basis of the straight line distance from people's homes to different types of park (pocket, local, district and metropolitan), but as acknowledged in the Delivery Plan, these were in the context of a 'big city' and therefore it was itself deemed to be of somewhat limited relevance.

E2.1.4 English Nature's own ANGSt model was published in 1995 and therefore is the most up to date of all the guidelines. Its use and implementation is however acknowledged by English Nature not to be widespread. Nevertheless in respect of its relevance to the Delivery Plan the standard is based on a number of assumptions and criteria that are key to the construction and consideration of the Delivery Plan. These include:

- The constraints on accessibility created by physical barriers, such as roads, railways, distances from home etc, and social and cultural factors, including the fear of crime.
- The over estimation of straight-line distances conventionally used to define the accessibility, and therefore people's propensity, to visit open or natural space.
- That small sites (i.e. those less than 2 hectares in size), can provide the visitor or user with enough space to consider it 'natural'.

E2.1.5 The model therefore appears to adopt a more pragmatic understanding and approach to the provision of accessible natural open space in towns and cities. Indeed, it does not reject the consideration of space that may traditionally have not been considered in assessing supply, such as hard surfaced play areas, or derelict buildings and car parks. These areas, it acknowledges, could still provide opportunities for creating new natural areas. As such, it follows that areas smaller than 2 hectares must also be considered, especially within an urban environment. This consequently results in much more space being considered and available to provide greenspace and perform a recreational function, and meet recreational demand.

E2.1.6 Its recommendations for the provision of such space to a degree reflect this therefore, although the conclusions and findings of Harman et al (1995) were not fully adopted. The model requires that:

- No person should live more than 300 metres from natural greenspace of at least 2 hectares in size.
- There should be 1 hectare of Local Nature Reserve per 1,000 population.
- Within 2 km of each house there should be at least one 20 hectare natural greenspace site.
- There should be a 100 hectare site within 5 km of every home.
- There should be a 500 hectare site within 10 km of every home.

E2.1.7 As the Delivery Plan acknowledges however, subsequent studies and assessments of the ANGSt model have questioned its relevance due to the data sets upon which it was derived. Further, the study by Handley et al (2003) notes the following key issues.

- That decreasing leisure time increases the need for the close proximity of open space.
- That walking distance in urban areas is key as most people in such areas visit open space on foot.
- That over 6 minutes walking distance, visits significantly decrease.
- That the difference between straight line distance and real distances should be taken into account in assessing catchment areas.
- The perceived inadequacy by users of the model of simply drawing an equal distance line around the green space to represent the catchment, as this fails to take account of access points and physical barrier.
- The need to adopt a flexible approach.
- The emergence of GIS, and its advantages in site and catchment identification.

E2.1.8 English Nature itself acknowledges within the Delivery Plan that the ANGSt model is 'of more limited value in assessing standards for the narrower range of the more extensive, informal, countryside recreation activities found on the heaths'. It also iterates that it is not designed to apply mitigation of potential threats to wildlife. What it does provide, along with the other models and guides that make up the Delivery Plan's evidence base in regard to this particular aspect, is the acceptance of catchment area as a means of measuring provision. Inherent within the identification of catchment areas is the adoption of a standard to go with it, and Handley et al (2003) reiterate the criticisms of such tools, going on to identify the recommendations to overcome these difficulties, these being:

- Taking a demand led approach.
- Standards being based on scientific evidence.
- The need for standards to take account of local variations, whether geographical or urban type.
- That standards should be placed in the context of open space strategies.

E2.1.9 With these recommendations, and assuming that they are correct, the models forming part of the evidence base for the Delivery Plan are outdated and out-moded, and the Plan recognises that. The identification of any other standards or guidelines that may be of relevance to the Delivery Plan is however a clear objective of this report, thus providing further comment on the depth and comprehensiveness of the evidence referenced.

E2.2 Other standards evidence and guidance

E2.2.1 A significant number of local authorities, including those with jurisdiction in or near the SPA, have adopted or prepared their own open space guidelines and standards for provision. Each is specific to its own geographical area, and relies on assessments of demand and supply to formulate appropriate, achievable standards of provision. Since 2002, assessments of open space provision have been informed by the revised PPG17, and in particular it's Companion Guide (ODPM 2002b). The Delivery Plan makes reference to these documents, but dismisses their relevance, stating that they relate to open space of a more local and more formal type. A study of the open space typology within Annex 2 of PPG17 does reveal an absence of rural, natural greenspace, including heathlands. However, it does refer to 'accessible countryside in urban fringe areas', albeit without defining what it regards as accessible. The role of the countryside, and in particular country parks and forests, is therefore noted within the Guidance and, as such, Companion Guide. Its relevance to the Thames Basin Heaths SPA and the Delivery Plan is therefore in many respects greater than the three models actually assessed by English Nature in the Plan.

E2.2.2 In particular, the identification of catchment areas within the Companion Guide offers clear assistance to the user in respect of their identification and evidence base. Examples that have relevance to the production of the Delivery Plan are as follows:

- The importance of management of the space, in particular in relation to its accessibility and its opportunities for various forms of recreational activity.
- The Guide reiterates the focus of PPG17 on the quality of the green space and its influence on the attraction of visitors.
- The need to consider other existing strategies that influence the management, promotion and use of open space.
- The importance of user surveys in identifying catchment areas and the impact of physical barriers to access.
- The recognition of the 'effective catchment' being the distance travelled by 75 – 80% of users, and 'distance thresholds', being the maximum distance that typical users may be expected to travel. High thresholds may be appropriate where no new provision to allow a wider supply is achievable, whilst lower thresholds may be applicable where evidence suggests that a significant proportion of the population will not use the identified space due to accessibility concerns.
- Forecasting future needs – assessing population change, including age structure, socio-demographic characteristics and trends in recreational use.

E2.2.3 The Delivery Plan has identified some of these issues through its review of the other guides. However, the core themes in PPG17 of quality, accessibility and, maybe most importantly, the move to local standards of provision, have not been referenced or explained notwithstanding its relevance and relatively recent publication. How its inclusion within the evidence base and therefore production of the Delivery Plan may have influenced its output and recommendations is considered later in this report.

E2.2.4 Other standards for the provision or protection of open space have been prepared, both in the UK and abroad. The necessity to review their context and methodology is not however considered appropriate or beneficial. Many base themselves on similar approaches to standard setting as set out in the reviewed documents above, whilst others are specific to particular recreational or other space types. Cultural attitudes to, and controls on, access to land, along with differing public transportation provision, climate and many other factors make comparisons with respective open space and recreational standards abroad unjust and unhelpful.

E2.3 Visitor Surveys

E2.3.1 As acknowledged by the Companion Guide to PPG17, up to date user surveys will provide a useful guide to measure demand for a facility or resources. This point is recognised by the Delivery Plan. It is clear that such surveys must be relevant to be useful, and the Delivery Plan therefore has used only such surveys of visitors to areas of land that are, or contain, lowland heath. It is not the objective or purpose of this report to repeat the findings of those surveys, for the Delivery Plan has identified and referenced what it considers to be the key data. Focus therefore relates more to the relevance of the visitor survey data used and therefore whether its results, coupled with the methodology for standard production identified above, provide English Nature with a robust basis upon which to recommend its respective standards of mitigation. Later sections of this report will address whether the Delivery Plan has, on the basis of the evidence, proposed correct and robust standards. As indicated however, this review now concentrates on the relevance of the survey data referenced.

E2.3.2 All surveys of visitors to recreational facilities or resources will have their own particular objectives. Each will therefore seek information and data sets to address these objectives. Limited conclusions can therefore be drawn from these surveys for other purposes, including the development of the Delivery Plan. That said, it is clear from the surveys evidenced by the Delivery Plan, that data or visitor behaviour and profile was a significant area of investigation. The results of the surveys therefore do all have relevance to the Thames Basin Heaths SPA.

E2.3.3 Another consideration that urges caution regarding the relevance of the survey's findings is that not all were undertaken at the subject area, the Thames Basin Heaths. Each area will have its own characteristics and its own particular attractions, some better known than others. For example, Ashdown Forest contains Pooh Corner and Poohsticks Bridge, being the forest upon which the Christopher Robin and Pooh Bear books were based. The area is therefore likely to act as a tourist attraction as well as an informal recreational resource. No area

will be the same and all will therefore, to varying degrees, see this reflected in the attraction of the site to visitors.

E2.3.4 The Delivery Plan refers to surveys at 10 different locations as its evidence base namely:

- Thames Basin Heaths
- Dorset Heaths
- Ashdown Forest
- New Forest
- Chobham Common
- Bourley and Long Valley Heath
- Woolmer Forest
- Cannock Chase
- Winfrith and Sandford Heaths
- Haldon Forest

E2.3.5 All 10 exhibit different characteristics and proximity relative to urban areas. Consistently the most common activity undertaken at each site was walking and dog walking, the evidence demonstrating that the popularity of the activity is not unique to just the Thames Basin Heaths.

E2.3.6 However no heathland site is identical to any other, and the relevance of the data collected from each, and its consideration in respect of the recreational use of the Thames Basin Heaths SPA is therefore not direct. However, many of the surveys addressed issues and sought visitor information that provide baseline information on the behaviour of visitors to heathlands and, with particular reference to the Delivery Plan for their catchment areas, methods of travel, reasons for visit and the time spent at the heath. The evidence on each of these issues is now reviewed in turn, not only that referenced by the Delivery Plan but other evidence that addresses visitor patterns at heathlands and in particular, the Thames Basin Heaths.

E2.4 Catchment area

E2.4.1 Most of the visitor surveys evidenced by the Delivery Plan sought information on the distance travelled by visitors interviewed, or where they lived. The results demonstrate that some heaths were utilised principally by people from the near vicinity. Others, such as Ashdown Forest or Cannock Chase, attracted visitors from further a-field, some of whom were visiting the area for a short break. In the latter case, with the distance travelled sometimes being over 100 miles or even from overseas, the relevance of the data is limited. That aside however, the evidence indicates that most have travelled a short distance, as indicated below where the distance travelled by the majority of visitors (approximately 75%) at each venue is listed.

Table E.1: Summary of visitor travel distances

Heathland	Maximum distance travelled by majority of visitors
Thames Basin Heaths	c.5 km straight-line distance to access points.
Dorset Heathlands	4.4 km straight-line distance to access points.
Cannock Chase	c.16 km (70% of respondents) to boundary.
Winfrith Heath	4 km to access points.
Sandford Heath	1 km to access point.
Bourley & Long Valley Heath	c.6 km to access point.

E2.4.2 At Ashdown Forest, 78% of visitors come from within West and East Sussex and Kent, with only 41% coming from the Ashdown Forest area. 2% come from overseas, due no doubt to the specific draw of Ashdown Forest in respect of its links to the stories of Pooh Bear.

E2.4.3 Cannock Chase apart, the majority of visitors come from within 5 km of the heath, although this measurement varied from the distance to an access point from home or the distance to the boundary of the heath from home. Some distance recorded relied upon the interpretation of distance travelled by the visitor. Notwithstanding that, it can be concluded that the Delivery Plans outer zone of 5 km is based upon recent supportive survey data and is thus reasonable.

E2.4.4 The two other mitigation zones prepared by EN in its Delivery Plan (400m and 2 km) show a disparate evidence base at the heaths studied and referenced in the Delivery Plan. Table E.2 below shows the proportion of visitors who reside in or have travelled from within those distances to visit the respective heathland.

Table E.2: Distribution of travel distances

Heathland	Percentage of visitors from within 400 m	Percentage of visitors from within 2 km
Thames Basin Heaths	c.6%	c.23%
Dorset Heathlands	c.24%	c.53%
Cannock Chase	Not Known	17.7%
Winfrith Heath	Not Known	21%
Sandford Heath	Not Known	100%
Burley & Long Valley Heath	c.10%	c.30%

E2.4.5 These distances are influenced of course by the relative proximity of the heath to the surrounding urban area. Heaths closest to nearby residential areas saw a higher proportion of short distance travelled, and a high proportion of visitors walking to the site.

E2.4.6 Other surveys have been undertaken on visitor access patterns for natural open space, including the Thames Basin Heaths, which were not referenced by the Delivery Plan. The majority of these surveys were prepared to accompany planning proposals for residential development in proximity to the Thames Basin Heaths SPA. Their findings are therefore relevant and provide comparative data to assess the suitability of the proposed mitigation zones etc.

E2.4.7 The additional evidence found of relevance is taken from the following sources:

- Recreation survey report related to the A3 improvements at Hindhead (Mott MacDonald 2003).
- Appropriate Assessment relating to a proposed residential development at land west of Park Street, Camberley (RPS Group 2004).
- Habitats Regulations Appropriate Assessment (Bracknell Forest Borough Council 2006).
- Former DERA Site, Chobham Lane, Chertsey – Chobham Common Visitor Survey Report (WSP Environmental, 2004)
- Study of Pet Ownership and Walking Patterns of Residents in the vicinity of St Georges Road, Aldershot (Consumer Focus 2006)
- Aldershot Urban Extension Visitor Survey Report Consultation Draft (Entec 2006)

E2.4.8 The Hindhead study found that 64% of visitors to the heath were from Guildford, although the study failed to report on the distance travelled. Account must be taken here however of the Devil's Punchbowl, a specific attraction within the site having the potential to draw visitors from further afield. A significant minority (25%) had travelled from towns or areas some 25 miles away or beyond. The report towards an Appropriate Assessment for Park Street, Camberley again notes the actual distances, but records that high proportions of walkers or dog walkers who visit the SPA at Bagshot (up to 84% during the week) live in the wards that abut the land and therefore have close or direct access to it.

E2.4.9 The St Georges Road, Aldershot study undertook its interviews at the homes of flat occupiers. It found that, of the residents of the 10 blocks of flats surveyed, 12% had travelled the 3.5 km to Ash to Brookwood Heath, whilst 3% had travelled the 1.6 km to Bourley and Long Valley. Visits there only took place once a month or less. The WSP survey found that 10% had travelled under one mile, 28% between 1 and 3 miles, 25% between 3 and 5 miles and 37% over 5 miles.

E2.4.10 The Bracknell Forest HRAA indicates that, using the visitor survey data from the Broadmoor to Bagshot Woods and Heath SSSI, 33.2% of all users come from within a 4 km radius. It found that the median distance travelled was 8 km, with dog walkers and joggers travelling shorter distances generally, and cyclists, walkers and nature walkers travelling further than the mean.

E2.4.11 The visitor survey undertaken by Entec in respect of the Aldershot Urban Extension consists of four surveys undertaken in the vicinity. Two surveys related to SPA land - Ash to Brookwood Heath, and Bourley and Long Valley. However, the latter only recoded car park use, and did not interview visitors. The other surveys relate to other recreational land.

E2.4.12 At Ash to Brookwood Heath, 94% of the respondents came from within 5 miles of the SPA, with 91% stating that it had taken them 10 minutes or less to travel to the site.

E2.5 Reason for Visiting

E2.5.1 Evidence is clear that dog walking appears to be the predominant activity at the heaths. The proportion of dog walkers recorded in the Delivery Plan cited studies was as set out in Table E.3.

Table E.3: The proportion of dog walkers recorded on heathland sites

Heathland	Proportion of dog walkers
Thames Basin Heaths	59%
Dorset Heaths	80%
Cannock Chase	27%
Winfrith Heath	79%
Sandford Heath	62%
Bourley & Long Valley Heath	71%

E2.5.2 Other evidence and survey material additional to that supporting the Delivery Plan re-iterates the popularity of the activity. The proportion of dog walkers recorded in other studies is shown in Table E.4.

Table E.4: The proportion of dog walkers recorded in other studies

Heathland	Proportion of dog walkers
Broadmoor to Bagshot Woods & Heath	~55%
Hindhead	27%
Chobham Common	49%
Ash to Brookwood Heath	57%

E2.5.3 The evidence shows that most dog walkers at all heaths were frequent visitors. Other reasons for visits varied dependant upon the specific heathland and its relative attractions. However, along with dog walking, recreational walking, cycling and jogging were the other common activities found, whilst horse riding and nature/bird watching were less frequent.

E2.5.4 A study of the psychology of people who own and regularly walk dogs (Edwards and Knight 2006) found that dog walkers preferred to take their dogs to where they perceived their pet was most happy – this normally meant locations where they were able to run off the lead, meet other dogs and not be in danger from traffic. Dog walkers were also attracted by the opportunity to meet other dog walkers, whilst reporting occasional conflict with other users, such as joggers or cyclists. Those visiting heathlands for dog walking are therefore doing so potentially as that is where others are undertaking the same activity, and that becomes the reason for visiting that heath. This suggests an option for a way to manage access – to zone a particular heathland, or across a set of heathlands, with one or more areas for dog walking and other areas for walking without dogs, jogging etc.

E2.6 Method of Travel

E2.6.1 The Delivery Plan concentrates on the evidence collected from surveys at the Thames Basin Heaths and Dorset heathland sites. It found, unsurprisingly, that the further the visitor travelled to the heath, the more likely they were to use a car to get there. However, variations were found in the likelihood of car travel for the shorter distances – 40% on foot within 400 m of Thames Basin Heaths against 71% at Dorset sites. The variation in this finding is not explained nor the reasons behind it.

E2.6.2 The reason for the visit did, to a degree, influence the method of travel. Those who visited heaths for the purposes of cycling or bird watching tended to travel by car as they originated from locations further away. The evidence does suggest that dog walkers' mode of travel is regulated principally by the distance travelled.

E2.7 Duration of the Visit/Penetration distances

E2.7.1 All surveys used in the Delivery Plan sought information on the duration of the visit. This required the interviewee to give answers that may not necessarily have been accurate. However the results provide a guide to the intensity of use of the SPA.

E2.7.2 At Bourley and Long Valley Heath and Sandford and Winfrith Heaths, the duration of the visit was generally less than one hour. Conversely, at Cannock Chase, the average was closer to 2 hours. Information on the length of visitor stays was not obtained in the surveys of users of the Dorset heathland sites or the Thames Basin Heaths, but the distances that visitors walked, cycled or rode horses whilst on the heaths was. At both the Dorset sites and Thames Basin Heaths, the average distance walked by dog walkers was between 2 and 2.5 km. Those jogging or cycling generally travelled further, those walking with no dogs slightly less. What the latter studies also noted however was that actual penetration into the heath

was not often greater than 1 km by dog walkers. In fact, penetration by all types of user at the Dorset sites was, on average, less than 1 km, whilst at the Thames Basin Heaths, joggers and cyclists were the only groups of users who averaged over 1.1 km penetration into the heath.

E2.7.3 Other surveys, not part of English Nature's evidence, have noted similar results to those identified above. At Hindhead, 67% of visitors in 2003 stayed for less than two hours. At Chobham, 73% of those interviewed expected to stay less than one hour, whilst only 6% believed they would be there for more than 3 hours. At Ash to Brookwood Heaths, 96% of visitors spent 2 hours or less on site.

E2.7.4 The final two elements of evidence reviewed in this section both relate more to analysis of visitors' choice. In particular, what the reasons were for visiting the respective heathland, and whether other sites are visited as well. This evidence provides indications of the key elements that influence a person's choice in where to go, and therefore identifying those elements that will be significant in any mitigation provision.

E2.8 Attractive/popular features of the heaths

E2.8.1 The opinions of visitors on the attractive/popular features of the heaths were not sought during the Thames Basin Heaths or Dorset site visitor surveys. However, English Nature did commission an earlier study into what attracted visitors to the Thames Basin Heaths. The report, 'The "Quality" of Green Space: features that attract people to open spaces in the Thames Basin Heath' (Liley et al 2005b) sought to inform the identification and design of SANGS. Its findings were also referenced in the Bracknell town centre regeneration appropriate assessment (Bracknell Forest Borough Council 2006). The ten most attractive characteristics of open space, as considered by users of the Thames Basin Heaths, are listed below:

- Ability to let the dog off the lead.
- Safety on site.
- Quick journey time from home.
- Parking.
- Convenient car access from home.
- Mix of conifer and broad-leaf woodland.
- Different lengths of routes.
- Presence of slopes or hills.
- Presence of water.
- Presence of viewpoints.

E2.8.2 At Cannock Chase, Bourley and Long Valley Heath and Sandford and Winfrith Heaths the following elements were all considered key to the attraction of the area covered.

- Ease of access.

- Attractive scenery.
- Peace and quiet.
- Close to home.
- Nature and Wildlife.

E2.8.3 Respondents to the Ash to Brookwood survey emphasised the importance of the ability to let dogs off a lead as a key attraction, with 85% stating it as very important, 83% confirming that they already let their dog off the lead the majority of the time. A total of 86% of visitors found the level of enjoyment provided by the site at very good.

E2.8.4 The majority of the factors listed are practical considerations, as opposed to physical constituents. Whilst this information is acknowledged to refer to issues of principle that influence visitor's choices, as opposed to issues of fact that influence a visitor's decision to visit a particular heath, the results nevertheless are important in differentiating necessary attributes as well as attractions.

E2.9 Alternative Sites

E2.9.1 Not all surveys sought information on whether the respondents visited other areas of open space. The study of Thames Basin Heaths sites found that, of those visiting, 75% stated that they visited alternative sites for the same purpose as they visit the Thames Basin Heaths, a figure that rose to 78% for dog walkers. Of the total who did, 60% travelled less than 5 km to the alternative site.

E2.9.2 At Bourley and Long Valley Heath, only 43% of those questioned stated that they visited other local locations, for the same purpose.

Appendix F: The draft Delivery Plan mitigation zones

F1 Introduction

F1.1.1 In this Appendix we consider whether the 400m, 2km and 5km mitigation zones are needed, appropriate and set at a reasonable level. An assessment made of whether the additional evidence referenced potentially affects the size or use of the zones.

F2 The need for mitigation zones

F2.1.1 The Delivery Plan, based upon the evidence it has reviewed, concludes that the distance one lives from the SPA is the key factor in determining the level of use by visitors, and shows that the intensity or scale of the impact decreases the further development is located away from the SPA. Upon this basis, it recommends the zones set at 400m, 2km and 5km and their application to the whole of the SPA and the land surrounding it.

F2.1.2 The evidence does support the Delivery Plan's conclusion and it does therefore provide a base for the foundation of mitigation zones. The key question however is whether their application represents an accurate and reasonable assessment of the degree to which the SPA will be both visited and potentially harmed by residents of new development. Any new development, depending upon its proximity to the SPA could have some impact. However, as is noted in the Delivery Plan, and as evidenced by the Liley et al study (2005a), actual visiting patterns will not always be influenced solely by distance, and other factors may mean that visitors to the SPA may not always go to the nearest access point. They may be influenced by physical barriers or find more pleasure at another further location due to its different appearance, parking facilities or nature. Physical barriers that may influence the choice of SPA access point are:

- Major road.
- Railway line.
- River (distance to nearest crossing).
- Hill or steep slope.
- Congested area/town centre.
- Poor access roads.

F2.1.3 Each access point, and development around it, will therefore face its own set of factors that would influence a person's choice of whether to use that nearest point onto the SPA. In addition, there will be factors in respect of the SPA itself that also influence a visitor's decision of where to access the heath. These will include:

- Ease of parking, if necessary.
- Choice of paths and routes in the SPA.

- Character of the particular part of the heath.
- Existence of nature/type of flora and fauna.
- Prevalence of other users, particularly cyclists and horse riders.
- Support facilities, such as toilets, visitor centre, café.
- Whether appropriate for dog walking.

F2.1.4 These considerations will all vary in and around the SPA. The Delivery Plan is therefore unable to prepare mitigation zones that reflect these variations, and therefore correctly it does not do so. Indeed, based upon the evidence it examined, the Delivery Plan progress 3 mitigation zones that are based principally on distance being the key factor influencing choice and therefore legislating the limits of the zone. For the reasons and considerations set out above, distance is clearly not the only factor, but to incorporate the remaining considerations into the decisions regarding mitigation zones is, on a generic scale, impossible.

F2.1.5 The mitigation zones proposed in the Delivery Plan are therefore no more than a guide based upon partial evidence, but nevertheless an appropriate guide that does provide an evidence based lead to developers considering or proposing development. The Delivery Plan does acknowledge that local evidence may indicate that the development should be treated as if in a different zone, or in none at all. However, it suggests that demonstrating that will be 'onerous and require assessment in combination with other plans and projects around the whole SPA'. The carrying out of such an in-combination assessment has proved to be a particular difficulty for those choosing to propose that a development be considered outside the framework of the Delivery Plan. Finding an effective means to satisfy the Directive's requirement for an in-combination assessment and developers' wish to have a streamlined and cost-effective process is a particular challenge for this project that aims to explore alternative ways forward. This is the subject of a later section in the report.

F2.1.6 The mitigation zones are considered a reasonable basis to consider any new development proposed against the underlying general trend in visitor movements and origins. For that reason, they are necessary. However, weight needs to be attributed to other factors that will affect visitor patterns, and these should be attributed greater weight within the Delivery Plan and encouragement given to developers to demonstrate which and how such circumstances apply to their own specific proposal. This is considered further in Section 8.

F3 The proposed mitigation zones

F3.1 Zone A to 400 metres

F3.1.1 The first mitigation zone, 400 metres or Zone A, represents the area of land closest to the SPA and where the Delivery Plan considers residential development is likely to have a significant effect on the SPA through, for instance, visitor disturbance, predation by cats etc. The evidence base for this focuses on the distance people walk to heaths and the range that domestic cats will travel from homes. A number of studies have found alternative distances or ranges. The

Delivery Plan sought to identify a reasonable generic figure for Zone A, and from the evidence found the following relevant data.

- At the Thames Basin Heaths, 40% of walkers to the SPA came from within 400 metres.
- At Dorset heathlands 75% of visitors on foot come from within 500 metres. (Liley *et al* 2005a).
- The majority of access points without car parking facilities were visited by those on foot.
- The ANGSt model proposes that no-one should live more than 300 metres from their nearest area of natural open space.
- More than 80% of visitors to Dorset who walked travelled less than 600 metres (Rose and Clarke 2005).
- The GLA model proposes 400 metres as the maximum distance to open space.
- A significant proportion of cats do not range further than 400 metres from home.

F3.1.2 Other data from the evidence base, such as that produced by Harrison et al (1995) who suggested that the distance to green space should be at most 280 metres in a straight line, is not referenced in the Plan, possibly because dated 1995, it may be considered outdated and/or superseded by more up to date survey data.

F3.1.3 Based upon the evidence reviewed in the Plan therefore, it is reasonable for English Nature to have proposed the 400 metre limit to Zone A as a guide to developers.

F3.2 Zone B ranging from 400 metres to 2 km

F3.2.1 The evidence base for the proposed limits of Zone B are the studies of visitor access patterns at Thames Basin Heaths (Liley et al 2005a) and Dorset heathlands (Clarke et al 2005). Indeed Zone B is principally evidenced by the Liley et al study, Clarke et al providing only some measure with which to compare. The Liley et al study is clearly relevant and specific to the Delivery Plan, and found that 95% of foot visitors to Thames Basin Heaths come from within 2 km, 79% within 1 km, whilst 38% of all visitors travel between 400 m and 2 km to the SPA. Over 60% of cyclists travelled less than 2 km, and approximately 35% of drivers travelled less than 2 km. The Delivery Plan, on this evidence, therefore proposed the 2 km boundary to Zone B, providing a delineation between Zone A where the impact on SPA is considered to be high, and 5 km which delineates the outer mitigation zone boundary.

F3.3 Zone C – 2 km to 5 km

F3.3.1 The evidence base to the Delivery Plan indicates that 76% of all visitors to Thames Basin Heaths surveyed by Liley et al come from within 5 km of the SPA, the figure being 72% at Dorset sites. These figures along with what is referenced as the 'spatial distribution' of the main parts of the SPA, and the 'distribution of

alternative green space', lead the Delivery Plan to conclude on the 5 km boundary. No explanation of the influence of these factors on the zone boundary is given, nor does the Plan reference other considerations found within the evidence base. This includes:

- Evidence from Liley et al 2005a that, beyond 5 km, there was no significant relationship between the number of houses surrounding an access point and visitor numbers.
- 94% of visitors to Dorset (Rose and Clarke 2005) lived in the neighbouring town (Bournemouth).
- 71% of visitors to Bourley and Long Valley Heath travelled less than 4.8 km.
- 85% of visitors to Winfrith Heath travelled less than 5 km.

F3.3.2 On this basis, on the empirical evidence that the Plan examined, it is reasonable that the 5 km outer zone boundary was identified and adopted to provide a guide to the possible impact of development on the SPA.

F4 Are the Zones Appropriate – Additional Evidence

F4.1.1 The previous section of this report identified other sources of information that add to the evidence base against which the consideration of potential mitigation of developments affecting the Thames Basin Heaths SPA must be judged. However, the quantity and quality of the additional evidence is low, with limited new data available on the likely distances that visitors to heathlands will travel.

F4.4.2 None of the additional evidence sought information which relates specifically to the mitigation zones proposed in English Nature's Delivery Plan. Furthermore, where information was sought on the location from which visitors had travelled it did not necessarily seek to identify actual distance, rather mostly the town area or ward where the interviewee lived. Unfortunately this provides this report with little additional robust evidence to challenge and question the mitigation zones proposed. That said, the following information can be deduced from the additional evidence reviewed, and it, along with a re-examination of the evidence based utilised by English Nature will allow some conclusions to be drawn as whether the proposed zones are appropriate.

F4.4.3 The data backing the Bracknell Forest HRAA was not clearly presented in a way to enable extrapolation of the results into the 3 mitigation zones. However, what can be considered from the survey is:

- The modal distance travelled by dog walkers was 3.2 km, the same as for walkers and joggers.
- Approximately 70% of the dog walkers travelled to the heathlands from within 5 km.
- The majority of joggers travelled from within a 5 km radius.
- Most cyclists walkers and nature watchers came from further than 5 km.
- Less than a quarter of dog walkers came from within 2 km of the heathland.

- Those arriving at the heathland on foot travelled an average of 2 km.

F4.4.4 This data indicates that the respondent had, on average, travelled a greater distance to the heathland than that recorded by other surveys referenced elsewhere in this report. However, this must be balanced against the various objectives of the questionnaire, the interpretation of the data which was not analysed and presented to address this particular issue, and the distance of the heathland access point at which the survey was undertaken from the urban area.

F4.4.5 The Chobham Common survey recorded distances travelled in miles. The 'spread' of distances travelled to the Common was fairly even and consistent between less than one mile up to 10 miles. Again however, as with the Bracknell Forest HRAA, the trend shows a generally greater distance travelled than those studies evidenced by the Delivery Plan. This is illustrated by the following data results.

- Only 38% of visitors come from within a 4.8 km radius.
- Only 3.9% had travelled 0.8 km.
- 10.4% had travelled 1.6 km.

F4.4.6 However, against this must be considered the distance that the Common is from any significant urban areas in north west Surrey. Indeed its context is not identical to that of the majority of the Thames Basin Heaths SPA.

F4.4.7 The study by Consumer Focus at St Georges Road, Aldershot was not undertaken at the heathland, but rather assessed how many of the residents walked in local parks, and areas within the SPA. Its data is not therefore directly comparable due to its limited survey base. However, taking that into account, the survey found that the majority of the residents (55%) visited the local urban park. Only 12% visited the Thames Basin Heaths SPA which at its closest is 1.6 km from St Georges Road.

Appendix G: A Methodology for the Assessment of Site Specific Factors

G1 Introduction

G1.1 This methodology is intended to provide a mechanism for introducing flexibility into the consideration of individual planning applications through the Delivery Plan, allowing site-specific considerations to be taken into account, whilst at the same time retaining certainty regarding information requirements and outcomes, which the Delivery Plan seeks to deliver. It is based on a scoring system that attempts to weight the various factors that may apply at a site.

G1.2 English Nature's Delivery Plan is essentially based on an assessment of the risk that housing development in the vicinity of the Thames Basin Heaths SPA will give rise to likely significant effects on the SPA. The requirement for mitigation of such effects is then set on the basis of zones based on distance from the SPA. In this methodology we seek to explore how the risk of such adverse effects, and thus the requirement for mitigation, may be modified by factors specific to the individual development. These factors are described in section 8 of this report. Other relevant factors which may be identified could be added as appropriate

G1.3 This should be seen as a first draft of the methodology. It has not been subject to any consultation, other than review by the project Steering Group, and would benefit from such consultation and refinement. However, it is put forward as an approach that we believe has merit.

G1.4 Applying the provisional scores set out below to proposed development sites, where sites achieved scores of more than 100 they would require no mitigation measures. Where scores were in the range 50-100, sites would be treated as if they were in Zone C. Where scores were less than 50 and sites were more than 400m from the SPA, they would be treated as if they were in Zone B. Sites less than 400m from the SPA would always be treated as being in Zone A unless there were very specific reasons why this should not be the case.

G1.5 Such a scoring system also provides a potential alternative to the funding of mitigation based simply on the Delivery Plan Zones. Rather than having two funding bands, it would be possible for funding to be based on the scores. Thus a maximum level of contribution would be set for those developments scoring 0 at 0.4km from the SPA. A minimum level would be set for those developments scoring 100. Intermediate levels of funding would apply according to the scale of scores between these values.

G2 Straight line distance from the proposed development to the SPA

This is the only factor considered in English Nature's Delivery Plan. The scores are set to match the boundaries of the development Zones A, B and C defined in the Delivery Plan.

Distance	Score
5.0km	100
4.5km	95
4.0km	90
3.5km	80
3.0km	70
2.5km	60
2.0km	50
1.5km	40
1.0km	25
0.5km	10
0.4km	0

G3 Practical walking route (sites within 2km)

Walking distance to the SPA is the principal factor in determining the limit of Zone B at 2km from the SPA. The scores are set so that a development located 1km from the SPA but where the walking distance was 2km would be treated as if it were in Zone C

> 0.5km longer than straight line distance	10
> 1.0km longer than straight line distance	25

G4 Practical driving route (sites within 5km)

Driving distance is the principal factor in determining the limit of Zone C at 5km from the SPA. The scores are set so that a development located 4km from the SPA but where the driving distance was 6km would be treated as if it were in Zone C.

>1.0km longer than straight line distance	5
>2.0km longer than straight line distance	10

G5 Alternative open space

The availability of alternative open space is an important consideration, provision of which is the basis of the mitigation provisions set out in the Delivery Plan. The areas of open space and distances from the development are based on the criteria for SANGS provision set out in the Delivery Plan. Since it will be difficult to assess the extent to which existing open space has the capacity to accommodate additional recreational use, the scores are fairly conservative and do not assume that the open space will provide full mitigation.

>40ha within 5km and closer than SPA	50
20-40ha within 5km and closer than SPA	40
12-20ha within 4km and closer than SPA	30
4-12ha within 2km and closer than SPA	20
2-4ha within 400m and closer than SPA	10

G6 MoD land

As explained in section 8 of the report, there are permanently closed MoD Danger Areas at Pirbright Range and Sandhurst Range. The scores are set to reflect the importance of lack of access to the SPA.

Closed Danger Area prevents access to SPA within 2km of development	50
Closed Danger Area prevents access to SPA within 5km of development	100

G7 Dog Prohibition Covenant

Whilst it is difficult to obtain firm evidence, there seems to be general acceptance that covenants to prevent the keeping of dogs are likely to be effective in apartments controlled by a management company. Such restrictions are also likely to be relevant for other managed accommodation, although there is probably a greater risk that they would not be fully effective. The scores are set accordingly. We do not consider that such covenants can be relied upon in the case of market housing.

Managed apartments	50
Other managed housing	30

G8 Managed retirement accommodation

Whilst retired people are often very active, and are potential visitors to the SPA, in the case of managed retirement accommodation with no provision for residents' parking we consider that the likelihood of visits to the SPA is significantly reduced. The scores are set accordingly.

>2km from the SPA with no residents' parking	100
<2km from the SPA with no residents' parking	50

Appendix H: Alternative approaches to that contained in the draft Delivery Plan

H1 Introduction

H1.1.1 These alternative approaches have been developed based on suggestions made at the two workshops, feedback from the Project Steering Group members, submissions by third parties and discussions amongst RPS staff.

H1.1.2 The alternative approaches have been laid out in a standard template to aid comparison and consideration.

H1.1.3 The alternatives that were considered to be of high priority have been worked up in greater detail than the medium to low priority. All alternatives are included in this Appendix, with the high priority ones set out in greater detail and listed first. These high priority alternatives have been given a code number and that coding is used to cross-refer them to the main report text. The medium and low priority alternatives are listed afterwards.

H1.1.4 In many cases the alternative approach concentrates on the detail of the delivery mechanism, that is the nature of site based restrictions or the body to create greenspace. As such they could be applied alongside the existing draft Delivery Plan, a revised version, or a mini-plan.

Approach:	Do nothing, there is not an issue		
Reference:	H.01		
Timescale: Short	Priority: High	Risk: High	Cost: Low

Concept

This concept takes as its basis a presumption that increases in recreational impact on the scale indicated by the 20 year housing projections would not have a significant impact on the bird populations on the SPA and hence SPA integrity would not be affected.

Action required:

1. LPAs would continue to make decisions on planning applications on a case by case basis taking onto account all normal planning requirements but they would not consider a material consideration any increase in visitor numbers. They would still need to take into account the other effects of residential development close to a heathland such as fly-tipping and arson.
2. English nature would not object to applications for residential development around the SPA on the basis of visitor numbers.

Comments:

This concept is included here for completeness.

The full 'do-nothing' approach would mean taking no account of the legal requirements of the Birds and Habitats Directive and is clearly not a tenable approach.

The evidence is such that a large housing development immediately adjacent to the SPA would have an impact through the combination of a local intense increase in visitors (particularly dog walkers), cat predation and illegal activities such as fly-tipping and arson.

System(s) required in combination with this approach:

None

Strengths:

Permits the majority of housing developments, that satisfy other planning criteria, to proceed.

Weaknesses:

The evidence is that a large housing development immediately adjacent to the SPA would have an impact.

Conformity with the Directives:

This alternative was included for the sake of completeness only and is clearly not a tenable approach. A failure to take into account development adjacent to the SPA would place local planning authorities in breach of their legal obligations under Article 6(3).

The evidence and legal opinion supports the draft Delivery Plan that any scale of new residential development, when considered in combination with other residential plans and projects, which lies within approximately 5 kilometres of the SPA boundary would have an adverse effect on the SPA.

Approach:	Suspend application of the Delivery Plan pending the production and assessment of the South East Plan		
Reference:	H.02		
Timescale: Medium	Priority: High	Risk: High	Cost: Low

Concept

The policies in the South East Plan and LDFs should be addressed first as the source of the pressures. A mitigation plan to tackle the identified pressures should be agreed through that democratic process. In the meantime residential development proposals should be treated on their individual merits, against existing local plan policies, as has been the case until very recently.

Action required:

1. LPAs to suspend their consideration of applications against the process set out in the draft Delivery Plan and return to the system that they used previously.
2. English Nature to stop objecting to small scale developments unless they alone have a significant effect due to their proximity to the SPA.
3. Large developments and/or those close to the SPA to be assessed on their individual merits and mitigation greenspace created if required based on their impact alone.
4. The South East Plan and LDFs to be the process through which the framework for decision making and mitigation requirements are developed and agreed.

Comments:

The consideration of the draft Delivery Plan through the South East Plan process, including the EiP, will provide an appropriate forum for consultation and debate, with opportunity for comment upon its contents and proposals by interested stakeholders. This process seeks to ensure that the draft Delivery Plan, or any alternative to it, is given ownership and statutory weight through the democratic process of consultation and plan-making.

The process of suspending the application of the draft Delivery Plan results in a series of actions not dissimilar to those that require a quota, a de minimis threshold or time limited consenting process.

There are some parallels with the current situation in Dorset where small scale developments do not receive an outright objection from English Nature despite the lack of an agreed strategy between LPAs.

System(s) required in combination with this approach:

A case-by-case system for assessing development applications.

Strengths:

It returns planning decisions to the system that operated before the draft Delivery Plan was promoted.

Weaknesses:

There will be a delay while the policy framework and mitigation requirements are agreed and in the meantime the pressures on the SPA may not be addressed adequately.

Approach:	Suspend application of the Delivery Plan pending the production and assessment of the South East Plan

Conformity with the Directives:

The obligation to comply with the obligations of the Directives arose, as a matter of law, on the classification of the Thames Basin Heaths SPA. The Competent Authorities do not have the discretion to defer compliance with the obligations. Suspending the application of the draft Delivery Plan and not replacing it with a case-by-case consideration of applications would give rise to a breach of the Habitats Directive.

The English Nature draft Delivery Plan is not a legally binding document. There is no automatic sanction for any Competent Authority who may choose not to observe the terms of the draft Delivery Plan. However, if a Competent Authority wishes to grant planning permission or adopt a land use plan which will lead to a net increase in residential development, of whatever scale, then it would be unlawful for it to do so without other evidence which enables the competent authority to be certain that the nature of the development or the way in which it will be carried out would mean there would be no adverse effect on the SPA or that the provisions of Regulations 49 and 53 can be satisfied.

Approach:	Drop the Delivery Plan in favour of a plan, monitor, manage approach		
Reference:	H.03		
Timescale: Short	Priority: High	Risk: High	Cost: Low

Concept

Proof of impact of new development has not been proven and until it is, housing development should be permitted with detailed monitoring of the possible impacts on the SPA. Only when significant impact of new development is identified is remedial action taken at the SPA to remove that short-term damage through visitor management, including the creation of alternative greenspace where justified. Action to reduce the impact of the damage caused by existing visitor pressure is not precluded in this plan-monitor-manage approach.

Action required:

1. LPAs to suspend their consideration of applications against the process set out in the Delivery Plan and return to the system that they used previously.
2. English Nature to stop objecting to small scale developments unless they alone have a significant effect due to their proximity to the SPA.
3. Large developments and/or those close to the SPA to be assessed on their individual merits.
4. Monitoring of sufficient detail to be put in place that it could detect the effect of any rising visitor pressure and to relate this to the source of the visitors such that appropriate mitigation measures could be put in place.

Approach:	Drop the Delivery Plan in favour of a plan, monitor, manage approach
Comments: This process emphasises the importance of detecting damage to the SPA and having a legally binding and funded system to address any impacts that might be detected before they became irreversible. There are some parallels with the current situation in Dorset where small scale developments do not receive an outright objection from English Nature despite the lack of an agreed strategy between LPAs.	
System(s) required in combination with this approach: Action to address the existing damage that is being caused by current visitors.	
Strengths: It returns planning decisions to the system that operated before the delivery plan was promoted.	
Weaknesses: It is not proactive in preventing any damage to the SPA. The funding of monitoring and remedial action would not be secured unless public funds were provided and developers are willing to contribute to a 'trust' that holds the money for the eventuality of damage being identified.	
Conformity with the Directives: As a matter of law, the precautionary principle is to be invoked where a Competent Authority is not able to conclude with certainty that there would be no adverse effect. In the case of the Thames Basin Heaths SPA the body of evidence available to English Nature is such that additional residential developments will, owing to the scale proposed, give rise to an adverse effect on the SPA. Therefore, the precautionary principle must be invoked. The fundamental difficulty with a plan, monitor, manage approach in these circumstances, where the likelihood of an adverse effect has already been identified, is that it requires the precautionary principle to be ignored. This approach would be in breach of the obligations under Article 6(3) of the Habitats Directive because it would mean that planning permissions were granted and land use plans adopted in circumstances where it is unlikely that sufficient avoidance measures would be proposed in order to avoid the conclusion being reached that there would be adverse effects on the integrity of the SPA.	

Approach:	Zones around the SPA with thresholds to apply a de minimis rule		
Reference:	H.04		
Timescale: Short	Priority: High	Risk: High	Cost: Low

Concept

A threshold is established for residential development around the SPA, defined by distance zones and number of dwellings (or bedrooms). If a proposed development falls below the trigger levels then the LPA can conclude no impact on the SPA. The proposed development would be granted permission (assuming all other normal planning requirements are satisfied).

Action required:

1. The setting of thresholds for size of development and distance from the SPA.
2. The testing of those thresholds to ensure that they are of such insignificant scale that it can be concluded that there is no resultant significant impact on the SPA.
3. Agreement between Government, LPAs and English Nature / Natural England to those thresholds

Comments:

It is not clear if such a threshold, if established in a Government circular, statutory guidance or primary legislation, would provide a defence for an LPA against questions of failure to take account of the need to protect the SPA.

System(s) required in combination with this approach:

There would need to be a parallel system (to be the existing case-by-case assessment) for the proposed developments above the threshold.

Strengths:

LPA action and resources could be focused on assessing the risk posed by the developments that are larger in scale and/or closer to the SPA.

Developers would be given greater certainty as to how their proposals would be treated.

Weaknesses:

The system would not account for the potential effect of the accumulation of a large number of small developments (below the de minimis threshold) over a long time period unless it was a time limited approach.

The position taken by English Nature to date would mean that they are unlikely to find such de minimis thresholds acceptable.

Approach:	Zones around the SPA with thresholds to apply a de minimis rule

Conformity with the Directives:

The difficulty with seeking to apply a de minimis rule is that it necessitates, first, a finding, supported by evidence, that the integrity of the Thames Basin Heaths SPA would not be adversely affected by permitting a certain level of increase in recreational use. In the absence of clear evidence of no adverse effects arising from a certain scale of increase in recreational use arising from new residential development, no Competent Authority could permit development and comply with its obligation under Article 6(3) of the Habitats Directive.

Further, the acceptance of the de minimis threshold ignores the obligation under Regulation 48 of the 1994 Regulations for the Competent Authorities to take into account the in-combination effects of all residential development proposals which fall within the category of residential developments with which the English Nature draft Delivery Plan is concerned.

The use of a de minimis approach could only proceed lawfully if it was supported by evidence, when considered in combination with all other residential development proposals, it would have no adverse effects on the integrity of the SPA. Whilst it is conceivable that a methodology may be advanced it to enable the identification of a de minimis threshold, which could then be allocated appropriately amongst the relevant Competent Authorities, this could proceed only if supported evidentially. Given the current unfavourable conservation status of the SPA it is not considered that this approach currently benefits from evidential support. Accordingly, any Competent Authority taking this approach would be in breach of Articles 6(2) and (3) of the Habitats Directive.

Approach:	Release small sites up to a threshold of say 1% population increase now		
Reference:	H.05		
Timescale: Short	Priority: High	Risk: High	Cost: Low

Concept

A threshold or quota is determined up to which small scale developments would be permitted (assuming all other normal planning requirements are satisfied) provided that they are more than 400 m from the SPA. The quota could be set by policy decision or by calculation based on a prediction of effects through an assessment process.

Action required:

1. The setting of the threshold number or quota for infill or windfall developments.
2. The testing of that threshold number to ensure that it is of such insignificant scale that it can be concluded that there is no resultant significant impact on the SPA.
3. Agreement between Government, LPAs and English Nature / Natural England to those thresholds

Approach:	Release small sites up to a threshold of say 1% population increase now
Comments: This threshold approach is similar to other alternatives that require a definition of a de minimis development that may or may not be applied over a fixed timescale.	
System(s) required in combination with this approach: There would need to be a parallel system (to be the existing case-by-case assessment) for the assessments of large developments and future small scale developments once the quota has been filled.	
Strengths: It would ease the burden on the smaller developers who concentrate on such infill and windfall sites.	
Weaknesses: It does not provide an answer to the long term issue of the large number of proposed new houses. There is little evidence from which to determine a quota or threshold by predictive means that can be scientifically justified. Determination of a quota or threshold by policy is likely to be contested, potentially to the European Court. The position taken by English Nature to date would mean that they are unlikely to find such a threshold or quota approach acceptable.	
Conformity with the Directives: Whilst this approach is not identical to the concept of zones around the Thames Basin Heaths SPA being identified within which thresholds for a "de minimis" level for development could be established, the legal principles are substantially the same. On the basis of the evidence which is currently available, no Competent Authority could conclude that a residential development proposal could proceed without giving rise to any adverse effects owing to the requirements to take into account in-combination effects. There is no evidential basis to enable a Competent Authority to conclude that residential development could proceed provided it did not give rise to an increase of more than 1% in the existing population. Whether the figure of 1% of the existing population was selected or another percentage, the fundamental difficulty remains that there is currently no evidential basis to enable any competent authority to conclude that that level of increase would not give rise to an adverse effect on the integrity of the SPA. Further, a selection of small sites more diversely spread around the Thames Basin Heaths SPA would not necessarily have any less effect than a single residential development. Yet this nature of evidence would be needed in order to justify the preference for small scale sites over large sites.	

Approach:	The sub-region approach		
Reference:	H.06		
Timescale: Short	Priority: High	Risk: Low	Cost: Low

Concept

This alternative is a means to deliver actions in a co-ordinated fashion across the area within which potential off-site effects on the SPA might originate. As originally proposed at the workshops it would require a redefinition of the current sub-regions used in regional planning. Alternative, smaller scale divisions of the area, such as 3-4 local authorities could deliver its objective of facilitating cross-boundary delivery of access management, green space planning and funding.

Action as originally envisaged:

1. Redefine the existing sub-regions in South East Plan to create a Thames Basin Heaths sub-region.
2. Define that sub-region as the equivalent of a growth area (but not calling it such) and then use that new status to release funding for SPA access management, greenspace improvement or creation.
3. Encourage cross-border working by the LPAs on TBH issues, using the availability of funds as an incentive.
4. Consider the use of a Local Delivery Vehicle or an existing body such as SEERA to manage the funds for greenspace.

Comments:

This process of directing funds into specific sub-regions has already been used by DCLG in the existing growth areas to provide additional greenspace for growing communities.

Defining a sub-region specifically for the SPA is considered at odds with the way in which sub-regions have been defined more generally in regional spatial strategies.

Alternative, smaller scale divisions of the area, such as 3-4 local authorities could deliver the objective of facilitating cross-boundary delivery of access management, green space planning and funding.

System(s) required in combination with this approach:

Access management plans for the components of the SPA are required.

A method to define the 'capacity' of existing heathland to accept visitors is required.

An agreed SANGS system is required.

Strengths:

A solution that apparently does not require any legislative change. The policy decision could be put in train very quickly although delivery would be medium term.

It is a mechanism that works in the existing growth areas.

Approach:	The sub-region approach
Weaknesses: Although quick to put in place, the timescale for the delivery mechanism remains as before, in the medium term. Obtaining new funding for green infrastructure or diverting it from the existing growth areas would be politically contentious. It does not address the issues relating to decision making on individual developments.	
Conformity with the Directives: This approach has been regarded as a means of securing the objectives of English Nature's draft Delivery Plan in the medium-long term. It may be that this approach is the one which is eventually adopted following the pilot period of the English Nature draft Delivery Plan. However, this approach is one for the medium-long term and it does not offer a solution to Competent Authorities faced with planning applications for residential development and land use plans in the meantime. Since the available evidence is such that adverse effects on the integrity of the Thames Basin Heaths SPA are identified unless avoidance measures are promoted, it would be unlawful for any competent authority to grant planning permission for residential development or adopt a land use plan which envisages residential development unless and until appropriate avoidance measures are in place. If this is not the case then the Competent Authorities concerned would be in breach of their obligations under Articles 6(2) and (3) of the Habitats Directive.	

Approach:	Use adopted LPA open space standards for SANGS determination		
Reference:	H.07		
Timescale: Short	Priority: High	Risk: Medium	Cost: Low
Concept Where required, the amount of new open space provided would be assessed utilising the existing open space standards within the respective LPA, and not either 16 or 8 hectares per 1000 population depending on the Zone.			
Action required: 1. LPA's to consider adopted development plan policy or, where not applicable or available, ANGSt or NPFA standards of provision.			
Comments: Owing to the severe lack of evidence to support the proposed 16 and 8 hectare mitigation standards as proposed, it is more robust to measure mitigation based on existing standards until evidence suggests otherwise.			
System(s) required in combination with this approach: An up to date PPG17 compliant assessment of open space provision and need.			
Strengths: Simple to implement and at minimal cost.			

Approach:	Use adopted LPA open space standards for SANGS determination
Weaknesses: Some assessments of open space will not audit or consider the SPA heathlands or consider similar provision as necessary. Will therefore not necessarily promote a like for like replacement or mitigation.	
Conformity with the Directives: [Not assessed as part of the legal opinion because it was tabled late in the development of the alternatives]	

Approach:	Strategic SANGS in advance of development		
Reference:	H.08		
Timescale: Medium	Priority: High	Risk: Low	Cost: High
Concept This would require the pro-active creation of greenspace between the SPA and existing settlements. Such greenspace would be planned and created even if there were not development proposals currently with the LPA (ie those caught in the 'moratorium'). It is a process that provides for both the needs of existing residents and future residents resulting from the proposed housing allocations in the South East Plan. Such open space needs arise through both SPA protection requirements (existing and future visitor pressure) and the normal process, through PPG17, of catering for sport and leisure activities of new communities. Once created, an assessment could be made as to the extent that there is proof of a change in visitor behaviour, relieving pressure on the SPA and the extent to which it could provide SANGS for any new development.			
Action required: 1. LPAs to use the LUC study and PPG17 studies to assess the need, availability and location of land that could be used as open space between existing settlements and the SPA. 2. DCLG to fund such SANGS through LPAs. A proportion of this funding could be clawed back through developer contributions if their development were in a location that the new residents would make use of it in preference to the SPA.			
Comments:			
System(s) required in combination with this approach: A case-by-case system for assessing development applications.			
Strengths: It brings greenspace forward faster and in advance of development. It allows monitoring to provide proof, or not, that the greenspace is diverting existing residents away from the SPA and attracting new residents who might otherwise have been predicted to visit the SPA. It tackles both the existing pressures on the SPA and new visitor pressure.			

Approach:	Strategic SANGS in advance of development
Weaknesses: It is not a process that would help deal with planning applications in the short term. Central government sources would have to fund the initial greenspace provision.	
Conformity with the Directives: This type of measure falls within the category of measures envisaged by Article 6(2) of the Habitats Directive. If the Competent Authorities are satisfied that strategic SANGS were to be provided independently of individual development proposals but which would be sufficient to satisfy sufficient recreational users of the Thames Basin Heaths SPA would be diverted to the SANGS then this approach would avoid the need for appropriate assessments to be undertaken in the case of each application for planning permission or prior to the adoption of any land use plan contemplating residential development. However, whilst this is an approach which may emerge over time, it does not remove the immediate need for Competent Authorities to comply with the obligations imposed by Regulation 48 of the 1994 Regulations in dealing with planning applications and land use plans in the meantime. Accordingly, in the absence of other avoidance measures, it is expected that the competent authorities would have to conclude in the case of virtually all residential development proposals that adverse effects on the integrity of the Thames Basin Heaths SPA would arise and, accordingly, to refuse planning permission and, indeed, refuse to adopt any land use plan dealing with the provision of residential development.	

Approach:	SANGS & Visitor management combination		
Reference:	H.09		
Timescale: Medium	Priority: High	Risk: Medium	Cost: Medium
Concept Since there is no evidence that new open space has proven effective in diverting people, especially dog walkers from heathland sites, there is a need to couple the provision of SANGS with heathland site visitor access management. This is to ensure that the new residents who find the SPA heathland more attractive than the new SANGS are managed to ensure that they do not add to the pressure on the SPA.			
Action required: 1. A programme of visitor access management to be implemented at any component of the SPA that is an alternative site to visit to any particular area of SANGS that is created for a new development.			
Comments: Although this proposal is phrased in terms of managing new residents who do not use the SANGS provided for them, there would be also be benefit to the SPA through managing the existing visitors to that component of the SPA.			
System(s) required in combination with this approach: A public awareness and education system to highlight the reason for the combination of restrictions and greenspace.			

Approach:	SANGS & Visitor management combination
Strengths: It tackles both the existing pressures on the SPA and new visitor pressure.	
Weaknesses: It undermines the case for SANGS provision.	
Conformity with the Directives: If this approach were based on the assumption that the SANGS provision will not divert recreational users from the Thames Basin Heaths SPA then, in the absence of other, effective, measures being proven, planning permission for residential development could not be granted because to do so would give rise to a breach of Article 6(3) of the Habitats Directive. This approach in itself, save for its assumption that new open space will not prove effective, it is not dissimilar from part of the existing proposed package of measures comprised within the Thames Basin Heaths Project. EN makes it very clear in the draft Delivery Plan that the provision of SANGS alone will not be sufficient. It proposes a package of other measures to support the SANGS concept. Accordingly, the SANGS and visitor management combination approach is not contrary to any provisions of the Directives.	

Approach:	Management to capacity		
Reference:	H.10		
Timescale: Medium	Priority: High	Risk: Medium	Cost: Medium
Concept Each piece of the SPA will have a carrying capacity for visitors (differing for classes of visitors such as walkers, dog walkers, cyclists etc) which when it is exceeded there will be a decline in the number of the Annex I bird populations (each species to be considered separately initially since the limited evidence is that their behavioural response differs). If this capacity can be defined (this requires further research) then it can be used as the basis for site-by-site management. Actions would be defined to ensure sites are managed to below that capacity.			

Approach:	Management to capacity

Action required:

1. Definition of what is capacity
2. Evaluation of each component SSSI (or management unit of SSSI) to define if it is below, at or above capacity
3. Management plans for each component SSSI
4. Action programmes / measures to:
   - Reduce intensity or nature of access where capacity exceeded.
   - Maintain intensity and nature of access where it is at capacity.
   - Accept or promote increase in the intensity and/or nature of access where it is below capacity. Increased use would come from people displaced from areas where capacity was exceeded and from new users of any new development.
   - Create SANGS where capacity remains exceeded even after actions above.
5. Use the information coming from 2 and 4 to define development planning zones within which:
   - New development will be permitted without additional access management being needed.
   - New development will be permitted but additional access management will be required to be funded by developers.
   - New development would only be permitted conditional upon additional greenspace being provided (this is when all accessible SPA land is at or above capacity).

Comments:

This approach gives priority to access management as the tool to protect the SPA.

SANGS are only required when there is no more capacity within any particular component of the SPA to be released though access management.

Large developments close to the SPA would still require a case specific assessment and potentially the provision of development related greenspace.

System(s) required in combination with this approach:

The development of this approach will take several years, an interim process is needed to judge if impact on the SPA will occur over that period.

A mechanism for the identification, funding and management of SANGS, including those needed because of existing visitor pressure unrelated to new development.

Strengths:

Addresses potential impacts directly – access management.

Addresses impacts produced by current recreational use as well as planning for future housing growth.

Clear line of responsibility – Natural England with their combined conservation and access duties for actions 1-4, LPAs for action 5.

Approach:	Management to capacity
Weaknesses: Defining capacity will require additional research and good communication for it to be accepted by user groups. Potential for access management to fail due to resistance from user groups. Costly and lengthy procedure. Need for SANGS may be identified that is unrelated to new development – who will fund this? Burden to implement would fall largely on English Nature/Natural England.	
Conformity with the Directives: Management of recreational use of the Thames Basin Heaths SPA is, in principle, acceptable and lawful. The management to capacity approach gives priority to access management as a tool for protecting the SPA, requiring SANGS only where there is no more capacity with any particular component parts of the Thames Basin Heaths SPA to be released through access management. On the basis of the evidence on which English Nature developed the draft Delivery Plan, the "management to capacity" approach would not enable the UK to satisfy its legal obligations under the Directives. In particular, such an approach could only be effective if there was sufficiently robust scientific evidence to support the identification of a capacity figure, and that figure had not yet been reached. Further, the approach is a short-term approach and even if studies showed that there was recreational use capacity in certain parts of the Thames Basin Heaths SPA, that capacity may soon be taken up and then there would be no mechanism for dealing with future residential developments. In the case of those developments, the application of Regulation 48 tests by any Competent Authority would lead to the conclusion that future residential development, beyond the capacity of the Thames Basin Heaths SPA, would adversely its integrity. Pending the identification of "capacity" in principle and then capacity figures for each component part of the Thames Basin Heaths SPA, and in the absence of associated avoidance measures, Competent Authorities could not lawfully grant planning permission for residential development or adopt any land use plan contemplating residential development.	

Approach:	Access management first and foremost		
Reference:	H.11		
Timescale: Short	Priority: High	Risk: Low	Cost: Medium

Concept

Access management is given the status of the highest priority mechanism to be applied on the SPA with greenspace provision as a follow-on complementary action.

Action required:

1. Access management plans for the component parts of the SPA to developed and implemented.
2. Greenspace to be provided in those cases where the access management plan requires measures to reduce visitor numbers on the SPA.

Comments:

Access management is given the highest priority because it tackles both the existing and predicted future pressures from visitors on the SPA. It avoids the problem that greenspace provision has not been proven to be effective in attracting all of the new residents away from the SPA.

Greenspace provision is used in combination with access management, in this circumstance it is not as the SPA protection answer but as a practical complementary action to restrictions on the SPA – it gives the 'displaced' persons and their dogs somewhere else to go, facilitating the acceptance of SPA restrictions and easing local political and community objections to the restrictions.

System(s) required in combination with this approach:

A case-by-case system for assessing development applications.

A public awareness and education system to highlight the reason for such restrictions.

Strengths:

It tackles the proximate cause of damage to the SPA – visitors, rather than tackling housing numbers and location with the attendant uncertainty over whether those new residents would wish to visit the SPA and might be diverted away with new greenspace.

Weaknesses:

Breaking the link with new development means that greenspace provision would need to be funded from public funds.

Approach:	Access management first and foremost
Conformity with the Directives: As with the management to capacity approach described above, the access management proposal relies upon evidence demonstrating that additional visitor numbers can be accommodated within the Thames Basin Heaths SPA without prejudicing the ability of the UK to restore and maintain at favourable conservation status the Thames Basin Heaths SPA. In isolation, it is not considered that the evidence would support the reliance by Competent Authorities on access management as sufficient to enable it to conclude that there would be no adverse effect on the integrity of the SPA in the context of any planning application for residential development or land use plan contemplating residential development. In the absence of firm evidence that access management alone can control the pressure of recreational users, the Competent Authorities could not conclude that there was no adverse effect on the individual component parts of the Thames Basin Heaths SPA.	

Approach:	Developers to fund improved SPA management		
Reference:	H.12		
Timescale: Medium	Priority: High	Risk: Medium	Cost: Medium
Concept Developers would be asked to become 'partners' in the resourcing of the access and habitat management plans in order to hasten their implementation and shorten the time before favourable condition is reached on the component SSSIs of the SPA and favourable conservation status is achieved for the Annex I birds of the SPA.			
Action required: 1. A system to be established for developer contributions to be directed at specific visitor management programmes on sites within the SPA.			
Comments: Priority would be given to funding access management over habitat management since it is new housing development that contributes to visitor pressure and for private heathland owners there are few funding sources whereas they can access funds for habitat management through Environmental Stewardship.			
System(s) required in combination with this approach: A continuing system for assessing development applications. A costed programme of access management plans for the component SSSIs of the SPA.			
Strengths: The principle of a developer funding visitor management on the SPA was accepted with the proposal put forward as part of the Queen Elizabeth II barracks development although in this case the 'developer' and the heathland owner where management would take place was the same – the MoD.			

Approach:	Developers to fund improved SPA management
Weaknesses: Some stakeholders have a policy objection to developers contributing to access management on land owned by public bodies on the principle that this should already have been funded with public money.	
Conformity with the Directives: As the Thames Basin Heaths SPA has already been identified as being of unfavourable conservation status, the UK has an obligation under Article 4(1) of the Birds Directive to take positive measures to improve the habitat. The approach of requiring developers to fund improved SPA management would simply change the identity of the source of funding for habitat management. The scheme itself would not address the challenges arising from increased recreational use giving rise to increased disturbance of the Annex I bird species for which the Thames Basin Heaths SPA has been classified. The provision requiring contribution toward access management plans suffers from the same weakness as the access management first and foremost approach considered above. This option does not address the critical issue which is that the sheer numbers of new dwellings predicted to be required and provided in the wider vicinity of the Thames Basin Heaths SPA will adversely affect the integrity of the SPA. Therefore, competent authorities applying Regulation 48 to individual development proposals and emerging land use plans could not be certain that the developments would not give rise to an adverse effect and the integrity of the Thames Basin Heaths SPA.	

Approach:	More controls on dogs		
Reference:	H.13		
Timescale: Short	Priority: High	Risk: Medium	Cost: Low
Concept Priority is given to breeding season restrictions on visitor access with dogs in targeted locations. The target locations are based on existing and predicted future dog walker pressures on the SPA.			
Action required: 1. Access management plans to identify those locations under the greatest pressure (spatial co-incidence of Annex I bird populations and high density visitor use, future locations for housing growth). 2. Implement at such sites a requirement for dogs to be on leads (not just under close control) on open access heathlands and, if legally possible, public rights of way crossing the SPA and registered Common Land.			
Comments: Management of dogs and their owners is given the highest priority because it tackles both the existing and predicted future pressures from visitors on the SPA. It avoids the problem that greenspace provision has not been proven to be effective in attracting all of the new residents away from the SPA.			

Approach:	More controls on dogs
System(s) required in combination with this approach: A case-by-case system for assessing development applications. A public awareness and education system to highlight the reason for such restrictions.	
Strengths: It tackles what is considered to be the greatest cause of disturbance to the Annex I birds – dogs – without imposing undue restrictions on other users of the heaths (eg walkers, cyclists) who might be expected to keep to clearly marked paths.	
Weaknesses: It is not clear the extent to which existing legal mechanisms can be used to require people to have their dogs on a lead when crossing open access land using public rights of way and when on registered Common Land.	
Conformity with the Directives: Although the recreational use of the Thames Basin Heaths SPA by dog walkers has been identified as a key issue in respect of the restoration and maintenance of the favourable conservation status of the Thames Basin Heaths SPA, it is not the only source of recreational use pressure. For this reason alone this proposal would not be sufficient, on its own, to enable the local authority to conclude that it amounted to an avoidance measure such that no adverse effects on the integrity of the Thames Basin Heaths SPA would arise from permitting residential developments to proceed alongside additional controls over the dogs. It would be contrary to the provisions of Regulation 48 of the 1994 Regulations for Competent Authority to rely on this approach in order to avoid the undertaking of an appropriate assessment associated with any residential development proposal.	

Approach:	A body to receive funds, purchase, create and manage greenspace		
Reference:	H.14		
Timescale: Medium	Priority: High	Risk: Medium	Cost: High
Concept An independent body would be created whose purpose was to receive funds, create and manage greenspace. It would take on those greenspace mitigation projects that a local authority did not want to acquire and manage itself or could not because the delivery of the greenspace would be outside the authority's area. It would also focus on the delivery of the larger and strategic sites that individual planning authorities might be reluctant to take on because they would provide for mitigation for several developments or future developments including those outside their area.			
Action required: 1. An independent body to be created with appropriate powers to enable it to achieve the objective of delivering greenspace provision.			

Approach:	A body to receive funds, purchase, create and manage greenspace
Comments: This approach is similar to the body that is identified in the "sub-region approach". It is not clear if a Local Delivery Vehicle, English Partnerships or some other existing public body could take on this role or if a new, independent 'Trust' or not-for-profit company would have to be established	
System(s) required in combination with this approach: A case-by-case system for assessing development applications.	
Strengths: Planning and resourcing could be done on a strategic basis rather than being constrained by administrative boundaries.	
Weaknesses: Compulsory purchase powers would be needed to avoid a new, inflated market being created for those parcels of land best suited to become mitigation greenspace. Such powers may not be available to a body that is not publicly owned. Public funds would be needed to establish this body and enable its early greenspace provision prior to it being able to 'claw back' some costs through developer contributions.	
Conformity with the Directives: The concept of a body being established to receive funds, purchase, create and manage greenspace is not, of itself, contrary to the Directives. However, it is incapable alone, on the basis of the evidence which is available to Competent Authorities, to enable the conclusion to be reached that there would be no adverse effects on the integrity of the Thames Basin Heaths SPA by granting planning permissions for residential development and adopting land use plans contemplating residential development until such greenspace provisions had been created. It well be a mechanism to consider for the longer term, but is insufficient on its own to avoid the application of the Regulation 48 test and the conclusion that there is no current avoidance measures and, therefore, there would be an adverse effect on the integrity of the Thames Basin Heaths SPA in the case of most residential development proposals and land use plans concerning additional residential development.	

Medium and low priority alternatives

Approach: Re-allocation of housing numbers away from SPA			
Timescale: Medium	Priority: Low	Risk: High	Cost: Low
Concept This requires a re-allocation of housing numbers away from the SPA on the basis that the SPA provides an environmental limit to housing growth in a localised area.			

Approach: Phasing of development across LPA area			
Timescale: Medium	Priority: Medium	Risk: Medium	Cost: High
Concept Encourage development to be brought forward in those parts of an LPA area that are farthest from the SPA and refuse closer applications for an interim period whilst a long term strategic plan and mitigation mechanism is agreed through the due democratic and local processes. This may need to be facilitated with targeted finance to put in the infrastructure that may be presenting a limitation to development of sites away from the SPA.			

Approach: Delivery Plan tuned to each component SSSI			
Timescale: Medium	Priority: Low	Risk: Low	Cost: Low
Concept This is a refinement of the current Delivery Plan for the whole SPA and is similar to the mini-plan approach but places the focus on the component SSSIs and their zones rather than administrative boundaries.			

Approach: Greenspace driven release of windfall housing allocation			
Timescale: Medium	Priority: Medium	Risk: Low	Cost: High
Concept LPAs to identify options for where greenspace needs to go, using the LUC study to sift possible sites, and to place those options into their LDF. LPAS to use 'pump-priming' funds from central Government to deliver that greenspace and then 'release' a zone within which windfall and/or infill development would be permitted up to a specified limit. The developers of that housing to pay a sum to the central 'fund' to repay the costs of greenspace provision. The effect is a proactively planned process of greenspace provision in advance of development, driven by sites identified through the LDF.			

Approach: Manage against SPA population at classification			
Timescale: Medium	Priority: Low	Risk: High	Cost: Medium
Concept Permit housing development without creating additional greenspace until recreation pressures increase to the point that the additional disturbance causes the population of Annex I birds to fall back to that which it was at the time of classification. A detailed monitoring programme would be required and allowance made for fluctuations that were independent of human action such as weather.			

Approach: Compensatory bird space that would offset losses due to disturbance			
Timescale: Medium	Priority: Low	Risk: High	Cost: High
Concept Accept damage to TBH and find some land elsewhere to turn into heathland to support the equivalent number of birds. This is a high risk approach because it attempts to bring into play that part of the habitats Directive that permits damage to an SPA if there is an over-riding public interest and no alternative. It seems unlikely that those tests could be passed and pursuing this approach would most probably result in an application to a court for legal intervention.			

Approach: Raising revenue for mitigation actions through market mechanisms and levies/taxes			
Timescale: Long	Priority: Medium	Risk: High	Cost: High
Concept Income for mitigation and management actions to be raised from those who directly threaten the SPA – those who visit it and live close to it. Possible sources include: Local dog licence Dog food levy Access charges for dog walkers Car parking fees/permits Supplementary annual community charge for housing close to SPA Bedroom tax			

Approach: Make the 400 m zone the location for interceptory greenspace			
Timescale: Long	Priority: Medium	Risk: High	Cost: Medium

Concept The 400 m buffer would be intentionally 'blighted' in development planning terms in order to create some available land that had no 'hope value' and hence could be allocated for public access. Such land would conveniently be placed between the housing and the SPA, creating a buffer into which visitors from local housing would be encouraged with subtle management measures such as gorse belts and the absence of footpaths discouraging people from walking further into the SPA.

Approach: Dealing with predators			
Timescale: Long	Priority: Medium	Risk: Medium	Cost: Medium
Concept Legal predator control, principally corvid, would be undertaken to reduce the frequency of egg or chick loss. Nightjar might be expected to benefit from this more than Woodlark or Dartford Warbler.			

Appendix I: The publications and reports referred to in the draft Delivery Plan

Table I.1: Documents and studies cited in the draft Delivery Plan

Author	Year	Title	Publisher
Byfield A & Pearman D	1996	Dorset's Disappearing Heathland Flora.	Plantlife and RSPB, Sandy, Bedfordshire.
Clarke, R., Liley, D. Underhill-Day, J. & Rose, R	2005	Visitor access patterns on the Dorset heathlands.	English Nature Research Report [unpublished]
DoE	1994a	UK Biodiversity Action Plan.	HMSO, London
DoE	1994b	Planning Policy Guidance 9.	HMSO, London
Edgar R.	1995	South East England Habitat Resources Survey.	Compiled by Edgar 1995, NCC, Lewes
Greater London Authority.	2005	The GLA guide to open space strategies.	GLA. London
Handley, J., Pauleit, S., Slinn, P., Barber, A., Baker, M., Jones, C. & Lindley, S.	2003	Accessible natural green space standards in towns and cities: A review and toolkit for their implementation.	EN Research Report 526. English Nature. Peterborough.
Harrison, C., Burgess, C., Millward, A. & Dawe, G.	1995	Accessible natural greenspace in towns and cities: A review of appropriate size and distance criteria.	EN Research Report 153. English Nature. Peterborough.
Hillman, M. (Ed.)	1993	Children, transport and the quality of life.	Policy Studies Institute, London.
Howkins C.	1997	Heathland Harvest: The uses of Heathland Plants Through the Ages.	Chris Howkins, Surrey
Land Use Consultants	2005	Going, going gone? The Nature cumulative impact of land development on biodiversity in England.	EN Research Report 626, Peterborough
Liley D and Clarke R.T.	2002	Urban development adjacent to heathland sites in Dorset: the effect on the density and settlement patterns of Annex I bird species.	EN Research Report 463, Peterborough
Liley D	2005	A summary of the evidence base for disturbance effects to Annex I bird species on the Thames Basin Heaths, and research on human access patterns to heathlands in southern England.	Footprint Ecology, Dorset.

Author	Year	Title	Publisher
Liley D, Jackson D, and Underhill-Day J.	2005	Visitor Access Patterns on the Thames Basin Heaths.	EN Research Report (in press), English Nature, Peterborough.
Liley, D, Mallord, J. & Lobley, M. J.	2005	The "Quality" of Green Space, features that attract people to open spaces in the Thames Basin Heaths area.	EN Research Report XX. English Nature, Peterborough.
Mathews, M. H.	1992	Making sense of place: Children's understanding of large-scale environments.	Harvester Wheatsheaf, Hemel Hempstead.
Mallord, J.W.	2005	Predicting the consequences of human disturbance, urbanisation and fragmentation for a woodlark *Lullula arborea* population.	School of Biological Sciences. Norwich, UEA. PhD.
MORI	2004	Bourley and Long Valley Heath users survey.	MORI Social Research Institute. London.
Murison G.	2002	The impact of human disturbance on the breeding success of nightjar *Caprimulgus europaeus* on heathlands in south Dorset, England	EN Research Report 483, Peterborough
National Playing Fields Association.	Undated.	The six acre standard.	NPFA. London.
Rose R.J. & Clarke R.T.	2005	Urban impacts on Dorset Heathlands: Analysis of the heathland visitor questionnaire survey and heathland fires incidence data sets.	EN Research Report 624, Peterborough
RSPB.	2003	Woolmer Forest Visitor Survey.	Unpub. RSPB. Wareham. Dorset.
Smith. S.	2000	Cannock Chase AONB visitor survey.	Staffordshire University, Keele, Staffordshire.
Stride, A.	2001	Survey of heathland use: Winfrith and Sandford Heaths.	Unpub. RSPB. Wareham.
Symes N.C. and Day J.	2003	A Practical guide to the restoration and management of lowland heathland.	RSPB, Sandy.
Taylor K, Anderson P, Taylor R, Longden K, Fisher P	2005	Dogs, access and nature conservation.	EN Research Report 649, Peterborough.
Taylor Woodrow.	2004	Queen Elizabeth II Barracks and Wakefords Copse. Recreational strategy. Technical Appendix A.	Taylor Woodrow Developments Ltd.
Terence O'Rourke,	2004a	Queen Elizabeth II Barracks, Wakefords Copse and the southern area: Management plan. Final Report.	Terence O'Rourke, Bournemouth.

Author	Year	Title	Publisher
Terence O'Rourke,	2004b	Queen Elizabeth II Barracks and Wakefords Copse. Visitor management Strategy. Technical Appendix L.	Terence O'Rourke, Bournemouth.
Turner, L.	2000	Haldon Visitor Survey. Dissertation	Exeter University. Exeter. Devon.
Tyldesley D. and associates	2005	Urban impacts on Dorset heaths A review of authoritative planning and related decisions.	EN Research Report 622, Peterborough
Underhill-Day	2005	A literature review of urban effects on lowland heaths and their wildlife.	EN Research Report 623, Peterborough
University of Portsmouth.	1996	The New Forest sport and recreation study.	University of Portsmouth. Portsmouth. Hampshire.
Wealden District Council.	2004	Ashdown Forest visitor survey: Preliminary results.	Wealden District Council. Hailsham, East Sussex.
Woodfield E, and Langston, R.	2004	Literature review on the impact of bird populations of disturbance due to human access on foot.	RSPB Research Report No.9, Sandy.
WSP Environmental	2004	Chobham Common Visitor Survey	WSP Environmental, Mountbatten House, Basing View, Basingstoke, RG21 4HJ

Table I.2: References listed in draft Delivery Plan Appendix 6 "A summary of the evidence base"

Author	Year	Title	Publisher
Alexander, I. and B. Cresswell	1990	Foraging by Nightjars *Caprimulgus europaeus* away from their nesting areas.	Ibis 132: 568-574.
Bibby, C. J.	1979	Breeding biology of the Dartford warbler *Sylvia undata* in England.	Ibis 121: 41-52.
Bibby, C. J.	1979	Conservation of the Dartford Warbler on English lowland heaths: A review.	Biological Conservation 13: 299 - 307.
Bowden, C. and R. Hoblyn	1990	The Increasing Importance of Restocked Conifer Plantations for Woodlarks in Britain: Implications and Consequences.	RSPB Conservation Review 4: 26-31.
Bowden, C. G. R.	1990	Nightjar habitat requirements - preliminary results from radio tracking in Thetford Forest.	Heathlands Conference II. Harrow House, Dorset, RSPB

Author	Year	Title	Publisher
Bowden, C. G. R.	1990	Selection of foraging habitats by Woodlarks (*Lullula arborea*) nesting in pine plantations.	Journal of Applied Ecology 27: 410-419.
Bowden, C. G. R. and R. E. Green	1991	The ecology of nightjars on pine plantations in Thetford Forest.	Unpublished RSPB report.
Burgess, N. D., C. E. Evans, and J. Sorensen	1989	Management case study: The Management of heathland for Nightjars at Minsmere, Suffolk.	Sandy, RSPB.
Catchpole, C. K. and J. F. Phillips	1992	Territory quality and reproductive success in the Dartford warbler *Sylvia undata* in Dorset, England.	Biological Conservation 61: 209 - 215.
Clarke, R. T., D. Liley, *et al.*	2005	Visitor access patterns on the Dorset Heaths.	English Nature Research Report.
Cramp, S. and K. Simmons	1977 – 1995	Birds of the Western Palearctic.	Oxford, Oxford University Press.
Cresswell, B.	1996	Nightjars - some aspects of their behaviour and conservation.	British Wildlife 7: 297-304.
Gibbons, D. W., J. B. Reid, *et al.*	1993	The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991.	London, T & AD Poyser.
Gimingham, C. H.	1992	The lowland heathland management book.	Peterborough, English Nature.
Gregory, R. D., N. I. Wilkinson, *et al.*	2002	The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002 - 2007.	British Birds 95: 410 – 448.
Holloway, S.	1996	The Historical Atlas of Breeding Birds in Britain and Ireland 1875-1900.	London, T&AD Poyser.
Lack, P., (ed)	1986	The Atlas of Wintering Birds in Britain and Ireland.	Calton, Staffs., T&AD Poyser.
Liley, D. and R. T. Clarke	2003	The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England.	Biological Conservation 114: 219-230.
Mallord, J. W.	2005	Predicting the consequences of human disturbance, urbanisation and fragmentation for a woodlark Lullula arborea population.	School of Biological Sciences. Norwich, UEA. PhD.
Moore, N. W.	1962	The heaths of Dorset and their conservation.	Journal of Ecology 60: 369-91.
Morris, A., D. Burges, *et al.*	1994	The status and distribution of Nightjars *Caprimulgus europaeus* in Britain in 1992. A report to the British Trust for Ornithology	Bird Study 41: 181-191.

Author	Year	Title	Publisher
Murison, G.	2002	The impact of human disturbance on the breeding success of nightjar Caprimulgus europaeus on heathlands in south Dorset, England.	English Nature RR 483
Robins, M. and C. J. Bibby	1985	Dartford Warblers in 1984 Britain.	British Birds 78: 269-280.
Sharrock, J. T. R., (ed)	1976	The Atlas of Breeding Birds in Britain and Ireland.	Tring, BTO.
Sitters, H. P.	1986	Woodlarks in Britain, 1968-83.	British Birds 79: 105-116.
Tubbs, C. R.	1963	The significance of the New Forest to the status of the Dartford warbler in England.	British Birds 56: 41-49.
Tubbs, C. R.	1997	The ecology of pastoralism in the New Forest.	British Wildlife 9: 7-16.
Witherby, H. F., F. C. R. Jourdain, *et al.*	1938	The handbook of British Birds.	London, Witherby.
Woodfield, E. and R. H. Langston [draft final report of 03-02-04][final report only available in 2006]	2004	A study of the effects on breeding nightjars of access on foot to heathland.	RSPB Research Report 11. RSPB Sandy.
Wotton, S. R. and S. Gillings	2000	The status of breeding Woodlarks *Lullula arborea* in Britain in 1997.	Bird Study 47: 212-224.