

eco-towns

Sustainability Appraisal and Habitats Regulations
Assessment of the **Eco-towns Programme**

Introduction





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Assessment of the **Eco-towns Programme**

Introduction

Prepared by Scott Wilson for Communities and Local Government

November 2008

Scott Wilson Ltd

Department for Communities and Local Government: London

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Contents

The structure of the eco-towns SA/HRA publications	5
1 Introduction	7
2 Communities and Local Government’s initial scrutiny of the bids	14
3 Sustainability Appraisal (SA) and Habitats Regulations Assessment (HRA) process and methodology	18
4 HRA: Likely Significant Effects	38
Appendix 1: Taking account of the scoping consultation responses	61
List of Tables	
Table 1: Initial categorisation	15
Table 2: Designation criteria	15
Table 3: Eco-towns banding	16
Table 4: Housing affordability pressure indicators	17
Table 5: Meeting the requirements of the SEA Directive	22
Table 6: Eco-town proposals, performance in the cross-government review and status in the SA and HRA	24
Table 7: Proposals arising from the <i>Living a greener future</i> consultation and status in the SA and HRA	26
Table 8: Locations considered in the SA and HRA of the Eco-towns Programme	27
Table 9: Tolerance distances of 21 water bird species to various forms of recreational disturbance	44
Table 10: Air pollution deposition for 1999/2000 vs. critical load at SACs in South East England	47
Table 11: Main sources and effects of air pollutants on habitats and species	49
Table 12: European sites that lie within 200m of major roads	59

List of Figures

Figure 1: Shortlist of potential eco-town locations	11
Figure 2: Five-stage approach to SA	
Figure 3: Overview of the assessment and the SA process for the eco-town locations	29
Figure 4: Four-stage approach to HRA	32
Figure 5: Traffic contribution to pollution at different distances from the road centre	52
Figure 6: Map of areas of relative water stress	54
Figure 7: Biological water quality of rivers and canals, 2005	55
Figure 8: Incremental annual concentration of NO ₂ (µg/m ³) arising from new housing in the South East	58

List of Boxes

Box 1: Eco-towns criteria	14
Box 2: The legislative basis for 'Appropriate Assessment'	31
Box 3: Steps involved in the Appropriate Assessment	35

Glossary	66
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The structure of the eco-towns SA/HRA publications

The Sustainability Appraisal (SA) and Habitats Regulations Assessment (HRA) of the draft Eco-towns Planning Policy Statement and Programme have been prepared by Scott Wilson Ltd for Communities and Local Government.

As the SA and HRA has been undertaken at a strategic level, it is necessarily broad in its assessment, conclusions, and recommendations. It takes a 'snapshot' of locations and proposals in September 2008, recognising that the proposals are continuing to be developed, and constitutes the first of a series of successive assessments that will be required as eco-town proposals are taken forward. Planning applications for eco-towns will also need to include a detailed Environmental Impact Assessment (EIA) and possibly HRA which may, in turn, also identify mitigation measures.

The SA and HRA should be read in four parts and an Annex:

- I) **The SA of the draft Eco-towns PPS**
- II) **The SA/HRA of the Programme – Introduction**
- III) **The SA/HRA of the Programme – Locational chapters**
 - Pennbury
 - Middle Quinton
 - Whitehill-Bordon
 - Weston Otmoor and Cherwell
 - Ford
 - St Austell (China Clay Community)
 - Rossington
 - Hanley Grange and Cambridgeshire
 - Marston
 - North East Elsenham
 - Rushcliffe
 - Greater Norwich
 - Curborough
 - Manby
 - Leeds City Region
- IV) **The SA/HRA of the Programme – Conclusions**

Annex: Profile of European Sites

The sections above are accompanied by a Non-Technical Summary which summarises the findings of the SA and HRA of the draft Eco-towns PPS and Programme.

All documents are available on the Communities and Local Government website at www.communities.gov.uk/ecotowns

If you have comments on issues raised in the SA or HRA please respond as part of the consultation on the PPS, details of which are set out at www.communities.gov.uk/ecotowns. If you would like further information on any of the above please contact the Eco-Towns Team at Zone 2/G9, Eland House, London, SW1E 5DU or by email to: ecotowns@communities.gsi.gov.uk

1 Introduction

1.1 Eco-towns Planning Policy Statement

- 1.1.1 Communities and Local Government has published for consultation an **Eco-towns Planning Policy Statement** (PPS), accompanied by a Sustainability Appraisal and Habitats Regulations Assessment. According to the Draft PPS, eco-towns are new settlements which *“will have sustainability standards significantly above equivalent levels of development in existing towns and cities”*¹. The eco-towns concept is designed to assist in meeting the twin challenges of providing additional housing and mitigating and adapting to climate change. The aim of the Draft PPS is to promote the development of *“exemplar projects that encourage and enable residents to live within environmental limits”* and *“provide a showcase for sustainable living and allow Government, business and communities to work together to develop greener, low carbon living”*, thus providing inspiration for future development. With this in mind, the Draft PPS sets out a range of minimum standards which will be used to define an ‘eco-town’. These cover a wide range of sustainability issues including biodiversity; climate change adaptation; employment; flood risk management; green infrastructure; homes; local services; transport; waste; water; and zero carbon.
- 1.1.2 As this Sustainability Appraisal has been undertaken at a strategic level, it is therefore necessarily broad in its assessment, conclusions, and recommendations. It takes a ‘snapshot’ of locations and proposals in September 2008 recognising that the proposals are continuing to be developed, and constitutes the first of a series of successive assessments that will be required as eco-town proposals are taken forward. Planning applications for eco-towns will also need to include a detailed Environmental Impact Assessment (EIA) which will, in turn, also suggest detailed mitigation measures.

1.2 Eco-towns Programme

- 1.2.1 The **Eco-towns Programme** has been developed with the aim of getting exemplar eco-towns off the ground, with development underway by 2016. The Government has short listed a series of potential eco-town locations following an initial call for proposals. These locations have been subject to a Sustainability Appraisal to assess their suitability for an eco-town, the findings of which are documented in this report. The locations have also been subject to a Habitats Regulations Assessment. In a parallel exercise, the Government is deciding which of the schemes related to the short listed locations will get backing or financial support from government through funding of associated infrastructure or partner public bodies.

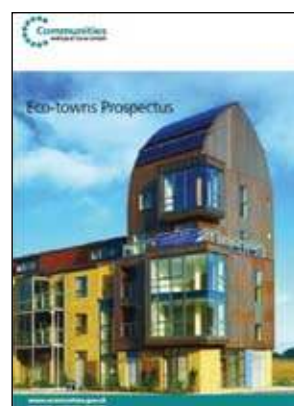
¹ Communities and Local Government (2008), *draft Planning Policy Statement: Eco-Towns – Consultation Document*

1.3 Developing the PPS and the Programme

1.3.1 In July 2007, the Government published the Housing Green Paper, *Homes for the future: more affordable, more sustainable*². This identified three key challenges in relation to housing: demand for homes to buy or rent is growing faster than supply; as house prices have grown faster than wages, it is becoming increasingly difficult for young people to get a step on the housing ladder; and climate change means that we need to provide greener, better-designed housing for the future. Alongside the Housing Green Paper, the Government published a prospectus setting out the vision and outline criteria for **eco-towns**³. The launch of the prospectus was accompanied by an invitation for local authorities, developers and other stakeholders to respond with their views on potential sites.

1.3.2 The Eco-towns Prospectus set out five essential requirements for eco-towns:

- Eco-towns must be **new settlements**, separate and distinct from existing towns but well linked to them. They need to be additional to existing plans, with a minimum target of 5,000–10,000 homes
- The development as a whole should reach **zero carbon** standards, and each town should be an exemplar in at least one area of environmental sustainability
- Eco-town proposals should provide for a **good range of facilities** within the town – a secondary school, a medium scale retail centre, good quality business space and leisure facilities
- **Affordable housing** should make up between 30 and 50 per cent of the total through a wide range and distribution of tenures in mixed communities, with a particular emphasis on larger family homes; and
- Have a **management body** which will help develop the town, provide support for people moving to the new community, for businesses and co-ordinate delivery of services and manage facilities.



² Communities and Local Government (2007)., *Homes for the future: more affordable, more sustainable* [online] available at www.communities.gov.uk/publications/housing/homesforfuture (accessed 5 August 2008).

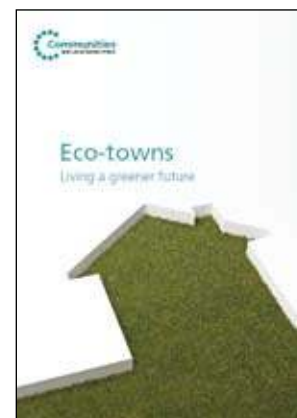
³ Communities and Local Government (2007), *Eco-towns Prospectus* [online] www.communities.gov.uk/publications/housing/ecotownspectus (accessed 5 August 2008).

1.3.3 Consultation on the Eco-towns Prospectus yielded 57 proposals and Communities and Local Government carried out an initial scrutiny of these in relation to the eco-towns criteria above, and where proposals met these, looked across government and its agencies at the transport and environment issues and opportunities in the locations put forward (see Section 2). A summary for each assessment has since been published⁴.

1.3.4 Subsequently, in April 2008, the Government published for consultation *Eco-towns: Living a greener future*⁵ which included a shortlist of the 15 potential eco-town locations which had performed most strongly in the initial scrutiny:

- Pennbury (Stoughton)
- Manby
- Curborough
- Middle Quinton
- Bordon-Whitehill
- Weston Otmoor
- Ford
- St Austell (China Clay Community)
- Rossington
- Coltishall
- Hanley Grange
- Marston
- North East Elsenham
- Rushcliffe
- Leeds City Region

1.3.5 In April 2008, Communities and Local Government also convened the Eco-town Challenge Panel, a group of 12 experts in design, the environment, transport and sustainability. The Panel was established to challenge and



⁴ Communities and Local Government (2008), *Eco-towns assessment summaries* [online] www.communities.gov.uk/publications/housing/Eco-townsassessmentsummaries (accessed 5 August 2008).

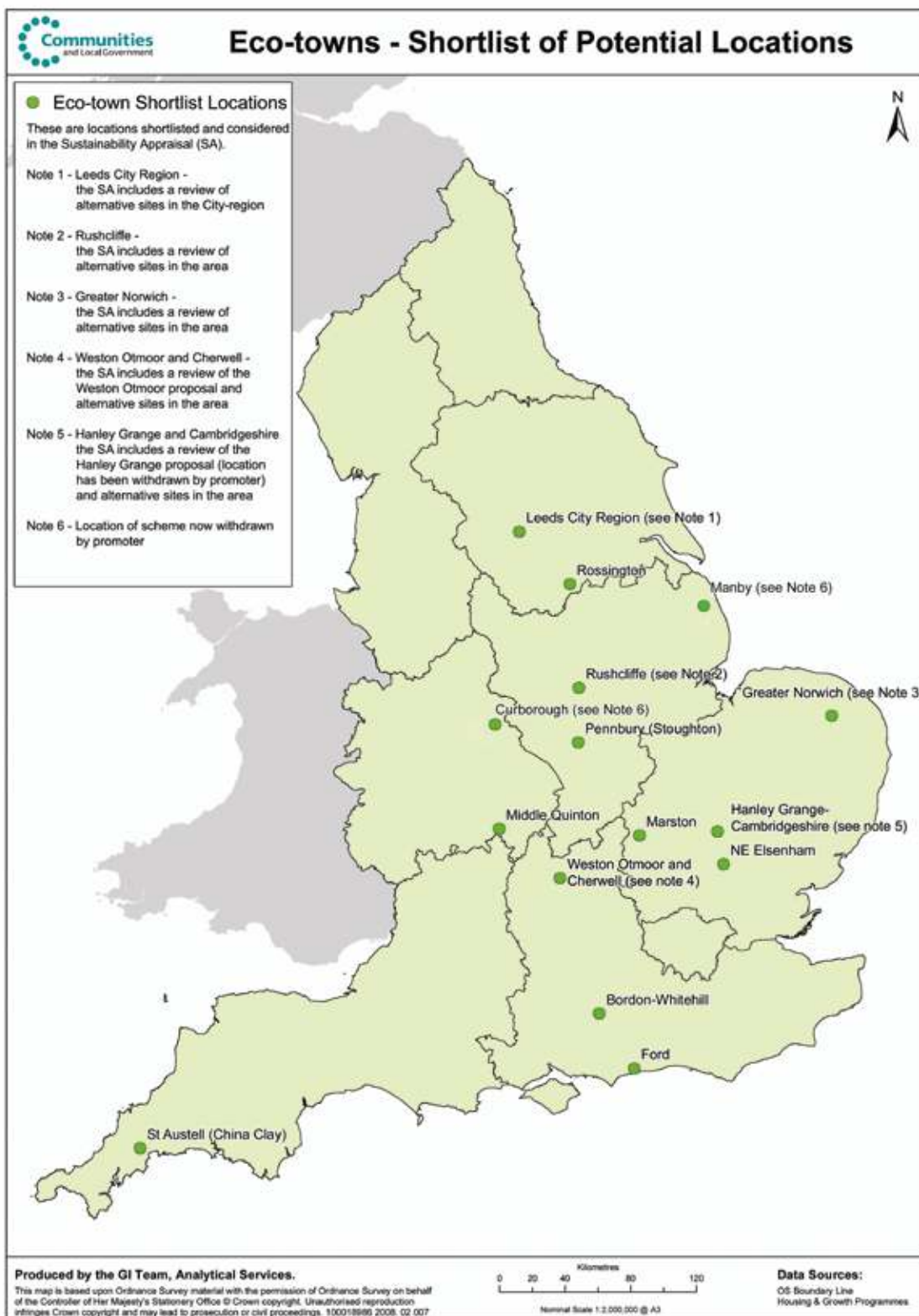
⁵ Communities and Local Government (2008). *Eco-towns: Living a greener future – consultation*, www.communities.gov.uk/publications/housing/ecotownsgreenerfuture (accessed 5 August 2008).

encourage eco-town promoters to develop and improve their proposals and to inject new thinking and expertise. The Panel has met twice, notes and recommendations from both sessions are published online⁶.

- 1.3.6 *Living a greener future* included a commitment that the shortlist of locations would “be subject to a more detailed Sustainability Appraisal (SA) which will provide greater detail on environmental sustainability and other issues and test them against reasonable alternatives”.
- 1.3.7 It should be noted that since the shortlist of 15 locations was published in April 2008, bids for four proposals – Manby, Curborough, Coltishall and Hanley Grange – have been withdrawn; however, these locations have nonetheless been included in the SA of the Eco-towns Programme. The SA has also included a focus on areas identified by Communities and Local Government for further review or where reasonable alternatives have been found in the course of the SA: Rushcliffe (which includes alternatives to the original Kingston proposal), Cherwell (which includes alternatives to the Weston Otmoor proposal), and the Greater Norwich Area (which includes Rackheath, an alternative to the original Coltishall proposal). Figure 1 shows the 15 potential eco-town locations (including schemes that the promoter has withdrawn). In Leeds City Region the local authority partnership has proposed a number of urban eco-communities which would test eco-town principles on brownfield sites and this is being pursued in further discussion with Communities and Local Government.
- 1.3.8 The SA also considers a number of reasonable alternatives in the short-listed areas.

⁶ Communities and Local Government (2008). *Notes and recommendations from session 1 of Eco-town Challenge* [online] www.communities.gov.uk/publications/housing/challengepanelnotes (accessed 5 August 2008); Communities and Local Government (2008). *Notes and recommendations from session 2 of the eco-town challenge* [online]: www.communities.gov.uk/publications/housing/ecotownschallenge (accessed 5 August 2008).

Figure 1: Shortlist of potential eco-town locations



1.4 Sustainability Appraisal (SA) and Habitats Regulations Assessment (HRA)

1.4.1 Sustainability Appraisal (SA) is generally not undertaken at the national level. In developing the Eco-towns PPS, Communities and Local Government has decided to undertake SA, incorporating the requirements of the European Strategic Environmental Assessment Directive⁷, at a level proportionate to the PPS. Scott Wilson was commissioned to undertake the SA as well as a Habitats Regulations Assessment (HRA) of the Draft Eco-towns PPS and the Eco-towns Programme (the potential eco-town locations). SA seeks to identify and evaluate the impacts of a proposal on the economy, the community and the environment – the three dimensions of sustainable development – and suggest measures for improving the proposal's sustainability performance. HRA tests the impacts of a proposal on nature conservation sites of European importance – Special Areas of Conservation and Special Protection Areas – and is also a requirement under EU legislation for certain plans and projects⁸.

1.4.2 It is important to note that the objective of the HRA was not to devise detailed site-specific avoidance or mitigation measures that would definitively enable each of the potential eco-towns to avoid adverse effects on European sites; instead the aim was to use an assessment of the potential eco-town locations as a tool to determine whether the policies and standards in the Draft PPS provided sufficient direction (in terms of both scope and detail) to enable both these and future eco-towns to deliver the detailed site-specific measures necessary to avoid or mitigate an adverse effect.

1.5 This report

1.5.1 This report sets out the SA and HRA of the Eco-towns Programme, ie the shortlisted locations and reasonable alternatives as appropriate. An accompanying report sets out the SA and HRA of the Draft Eco-towns PPS.

1.5.2 This report should be read in three parts:

- Introduction
- Locational chapters
 - Pennbury (Stoughton)
 - Middle Quinton

⁷ Directive 2001/42/EC on the assessment of the effects of certain plans and Programmes on the environment (the 'SEA Directive') implemented through The Environmental Assessment of Plans and Programmes Regulations 2004

⁸ Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') implemented through The Conservation (Natural Habitats, &c.) (Amendment) Regulations 2007

- Whitehill-Bordon
- Weston Otmoor and Cherwell
- Ford
- St Austell (China Clay Community)
- Rossington
- Hanley Grange and Cambridgeshire
- Marston Vale
- North East Elsenham
- Rushcliffe (Nottinghamshire)
- Greater Norwich
- Curborough
- Manby
- Leeds City Region
- Conclusions

1.5.3 This introduction is structured as follows:

1.5.4 Section 1 – Introduction

- Section 2 – Communities and Local Government’s initial scrutiny of the bids
- Section 3 – SA and HRA process and methodology
- Section 4 – HRA: Likely significant effects

2 Communities and Local Government's initial scrutiny of the bids

2.1 Introduction

2.1.1 Consultation on the Eco-towns Prospectus⁹ yielded 57 proposals and Communities and Local Government carried out an initial scrutiny of these with a view to shortlisting potential locations. This section sets out the steps in the initial scrutiny process.

2.2 Initial categorisation

2.2.1 Communities and Local Government received 57 proposals, some led by local authorities but the majority by developers. Communities and Local Government then undertook an initial broad sift of the bids against the eco-towns criteria set out in the Eco-towns Prospectus¹⁰ – see Box 1 – and categorised them as very strong; strong; medium; or poor – see Table 1. The broad sift was undertaken on an internal basis partly because Communities and Local Government anticipated that some of the proposals would have little prospect of being taken forward and that to publicly identify such proposals would have led to a period of uncertainty for the communities concerned.

Box 1. Eco-towns criteria

- Eco-towns must be new settlements, separate and distinct from existing towns but well linked to them. They need to be additional to existing plans, with a minimum target of 5,000–10,000 homes
- The development as a whole should reach zero carbon standards, and each town should be an exemplar in at least one area of environmental sustainability
- Eco-town proposals should provide for a good range of facilities within the town – a secondary school, a medium scale retail centre, good quality business space and leisure facilities
- Affordable housing should make up between 30 and 50 per cent of the total through a wide range and distribution of tenures in mixed communities, with a particular emphasis on larger family homes; and
- Have a management body which will help develop the town, provide support for people moving to the new community, for businesses and coordinate delivery of services and manage facilities.

⁹ Note that to follow-up the Housing Green Paper and the Eco-towns Prospectus, in August 2007 Communities and Local Government wrote to local authorities, regional assemblies, regional development agencies and a wide range of other potential partners to draw their attention to the process of expressing interest.

¹⁰ Communities and Local Government (2007). *Eco-towns Prospectus* [online] www.communities.gov.uk/publications/housing/ecotownspectus (accessed 5 August 2008).

Table 1: Initial categorisation

Very Strong	Overall development of scheme, including environment and transport, addresses the eco-towns criteria with a high quality bid, and in a sustainable location.
Strong	Overall development of scheme, including environment and transport, addresses the eco-towns criteria with a high quality bid, and appears to be in a sustainable location.
Medium	Overall development of scheme appears reasonably consistent with eco-towns criteria. There may be issues of environment, transport, and location.
Poor	Overall development of scheme insufficient, or not consistent with eco-towns criteria. There are clear issues of environment, transport, and location.

2.2.2 Communities and Local Government then designated each bid according to the criteria in Table 2. A total of 33 schemes were confirmed as sufficiently strong to be considered through the regional review process.

Table 2: Designation criteria

Review	Scheme considered suitable to go forward for cross-government review
Reserved	Scheme not considered suitable for cross-government review, however, may be discussed
List Only	Scheme not considered suitable to go forward for full cross-government review, however, will be brought to attention of cross-government and may be discussed.

2.3 Cross-government review

2.3.1 Communities and Local Government then took forward assessment of the bids through a cross-government review of the proposed locations, mainly covering the transport and environment impacts in each case. Transport and the environment were focused on since Communities and Local Government considered these to be the two principal place-specific factors governing the success of a growth proposal. The cross-government review was also a 'showstopper' review that enabled Communities and Local Government to identify if there were any factors which would make it difficult or impossible to realistically provide infrastructure to serve a new settlement in that location or if the environmental impacts were unacceptable.

2.3.2 The cross-government review was carried out at a regional level with Department of Environment, Food and Rural Affairs, Department for Transport, English Heritage, Environment Agency, Government Offices, Highways Agency and Natural England. For the purposes of the Review, a short draft summary of the scheme and supporting documents were circulated to the key departments and agencies to inform a round table discussion held on a regional basis with all parties represented, including the Government Offices. At the meetings the agencies were invited to give

views on the sustainability impacts of the locations under review, using the banding in Table 3.

Table 3: Eco-towns banding

A	Scheme which meets criteria and no significant issues at this stage
B	Scheme which meets criteria with significant issues but can be addressed in the further development of the scheme, through conditions, further studies of impacts etc.
C	Scheme which meets criteria and a location where this type of growth is possible but there are highly significant issues on which government needs to be assured before a bid could proceed
D	Scheme which meets criteria but potential showstopper – where the cross government review indicates that growth of this type in this location looks to be unachievable without unacceptable consequences in terms of environment, sustainability and cost
E	Scheme which meets some of the criteria, but the scheme is poorly developed and does not contain realistic and deliverable proposals to tackle the infrastructure and development requirements (in particular transport and environment) appropriate to a new development
F	Scheme which fails to meet key criteria, including demonstrating additionality of housing numbers, minimum size, or is based on a conventional urban extension approach, lacking an independent centre or facilities

2.3.3 Discussions centred on those locations which had been listed for review. However, comments were also invited on locations which had been categorised as Reserve or List Only. List Only categorisations were overall confirmed as E or F and some other bids were also scored in these categories. Any bid scoring D or below was regarded as a ‘showstopper’ in terms of environmental and transport impacts on the information available at that stage.

2.3.4 In some cases, further information was sought from promoters of schemes, or agencies required more time to consider the impacts of a bid. These further deliberations led to changes in some of the assessments. The outcomes of these discussions, including any changes to the assessment bandings were recorded on a series of Assessment Summaries published on the Communities and Local Government website¹¹.

2.4 Deliverability assessment

2.4.1 In parallel to the cross-government review, on 22 November 2007, Communities and Local Government wrote to all 57 of the scheme promoters, requesting further information on the key infrastructure requirements of the schemes; the extent to which they were able to contribute to the costs of delivery; and their plans for local consultation on proposals. This information was fed into an early assessment of deliverability.

¹¹ Communities and Local Government (2008). *Eco-towns assessment summaries* [online] www.communities.gov.uk/publications/housing/Eco-townsassessmentsummaries (accessed 5 August 2008).

Communities and Local Government then appointed John Walker, former Chief Executive of the British Urban Regeneration Association and the Commission for New Towns, as delivery adviser to assist in carrying out initial scrutiny of the more promising bids from a delivery perspective, questioning the relevant bidders as necessary. On the basis of the information provided, Communities and Local Government gave a delivery assessment of strong, medium or weak to those schemes with potential that had emerged from the cross-government review.

2.5 Affordability pressure

- 2.5.1 All 57 locations were also assessed against housing market pressures, according to the indicators in Table 4.

Table 4: Housing affordability pressure indicators

A	Extreme affordability pressure	Ratio of lower quartile house price to lower quartile income is above 10
B	Very High affordability pressure	Ratio of lower quartile house price to lower quartile income is between 8.5 and 10
C	High affordability pressure	Ratio of lower quartile house price to lower quartile income is between 7 and 8.5
D	Moderate affordability pressure	Ratio of lower quartile house price to lower quartile income is between 5.5 and 7
E	Low affordability pressure	Ratio of lower quartile house price to lower quartile income is below 5.5

2.6 Shortlisting

- 2.6.1 Of the 33 schemes considered at the regional review a total of 18 scored sufficiently well on the A to D grading and on delivery to be judged at that stage to be capable of going forward into a shortlist for wider consultation. This included two areas – Rushcliffe and Leeds City Region – where, in the light of views from the relevant authorities who wished to consider areas of search in greater detail – Communities and Local Government agreed to a further review of potential sites rather than endorsing a specific scheme at that stage. In three cases where two schemes were competing in the same sub-region, a further review against eco-town criteria and the issues raised in the cross-government review was carried out to identify the stronger candidate.
- 2.6.2 In determining the shortlist of locations with the potential to go forward as an eco-town, Communities and Local Government took into account the following factors: a score of C or higher on the banding approach undertaken at the cross-government review; the housing market pressure in that area; and the assessment of deliverability. During the assessment process, Communities and Local Government also took informal soundings from local authorities and regional partners before short listing the 15 locations.

3 SA and HRA process and methodology

3.1 Introduction

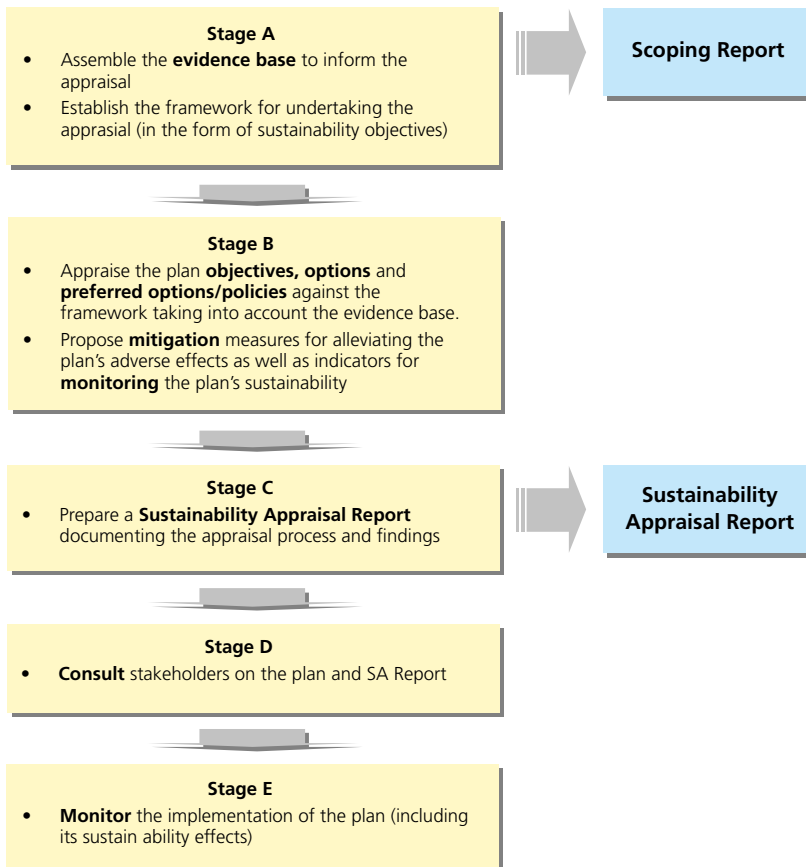
3.1.1 This section sets out the **process** and **methodology** for undertaking the SA and HRA of the Eco-towns Programme.

3.2 Sustainability Appraisal

SA process

3.2.1 Government guidance sets out a five-stage approach to undertaking SA which incorporates the requirements of the EU ‘SEA Directive’ – see Figure 2¹².

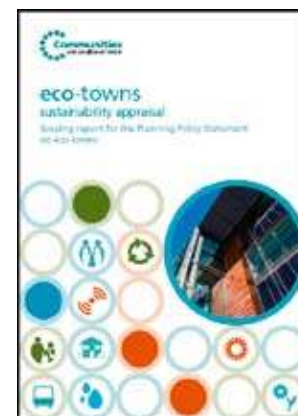
Figure 2: Five-stage approach to SA



¹² Office of the Deputy Prime Minister (2005). *Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents* [online] www.communities.gov.uk/publications/planningandbuilding/sustainabilityappraisal (accessed 8 September 2008)

Stage A – Scoping

- 3.2.2 Stage A in the SA process involves developing an evidence base to inform the appraisal and a framework – generally a set of sustainable development objectives – upon which to base it. The evidence base and framework are typically presented in a Scoping Report and consultation on the scope is required with certain stakeholders (including English Heritage, the Environment Agency and Natural England). In this case, the initial draft of the Scoping Report was prepared for Communities and Local Government by consultants Faber Maunsell. The Scoping Report was subject to consultation with the statutory consultees for five weeks from 2 June – 8 July 2008. The statutory consultees also took part in a scoping workshop during the consultation period. The final version of the Scoping Report (including its appendices) was published in July 2008¹³. Appendix 1 sets out how the consultees’ responses were taken into account in undertaking the SA. The Scoping Report applies to both the Draft Eco-towns PPS and the Eco-towns Programme.



Stage B – Appraisal

- 3.2.3 Stage B in the SA process involves undertaking the appraisal itself. This involves identifying and evaluating the impacts of the different alternatives or options open to the plan-makers as well as the preferred options/policies which together comprise the draft plan. Mitigation measures for alleviating adverse impacts are also proposed at this stage together with potential indicators for monitoring the plan’s implementation. In this case, Communities and Local Government commissioned Scott Wilson to undertake Stages B and C in the SA of the Eco-towns Programme (and the Draft Eco-towns PPS) and assist with Stage D.

Stage C – Report

- 3.2.4 Stage C in the SA process involves documenting the appraisal and preparing the SA Report (this incorporates the material required for inclusion in the ‘Environmental Report’ under the SEA Directive). In this case, this report provides the output for Stage C.

¹³ Communities and Local Government (2008). *Eco-towns: Sustainability appraisal – Scoping report for the Planning Policy Statement on eco-towns* [online] www.communities.gov.uk/publications/housing/ecotownsscopingreport (accessed 5 August 2008); Communities and Local Government (2008). *Eco-towns: Sustainability appraisal – Scoping report for the Planning Policy Statement on eco-towns – Appendices* [online] www.communities.gov.uk/publications/housing/ecotownsscopingreportapps (accessed 5 August 2008).

Stage D – Consultation

- 3.2.5 Stage D in the SA process involves consulting on the draft plan and the accompanying SA Report. In this case, the consultation period is 12 weeks, in accordance with government guidance.

Stage E – Monitoring

- 3.2.6 Stage E in the SA process involves monitoring the adopted plan including its sustainability impacts. In this case regional and local planning authorities are likely to be largely responsible for monitoring.

SA methodology

- 3.2.7 A SA was undertaken for each of the shortlisted potential eco-town locations and reasonable alternatives as appropriate (see below). The SA for each location is set out in a separate chapter and is organised around a series of questions reflecting the requirements of the SEA Directive:
- What's the objective of the proposal?
 - What's the policy context?
 - What are the key sustainability objectives we need to consider?
 - What's the situation now? (including any existing problems)
 - What will be the situation *without* the eco-town? (the 'business-as-usual' option)
 - What will be the situation *with* the eco-town?
 - How can we mitigate/enhance effects? (Scott Wilson's recommendations)
 - How should we monitor sustainability impacts?
- 3.2.8 These questions correspond to the key requirements of the SEA Directive, as set out in Annex I to the Directive – see Table 5. It should be noted that this question-based approach to undertaking SA is significantly different from standard approaches to SA. However, we have followed this approach since we feel that it assists in making the appraisal more engaging and accessible than the standard approach which tends to be dominated by matrices.
- 3.2.9 In undertaking the appraisal for each location, we drew on a wide range of information including the Scoping Report; the developer's proposal; discussions with the developer; discussions with the relevant local planning authority and, in some cases, the Government Office; the comments of the statutory consultees (English Heritage, the Environment Agency and Natural England); and discussions with Communities and Local Government. We also visited each of the shortlisted locations.

3.2.10 As part of the SA process, the key strengths and weaknesses of each potential eco-town location were identified. In particular, the sustainability of each location was gauged with reference to a series of sustainability indicators linked to the appraisal criteria. On the basis of this information, each location was then graded A – C in terms of its suitability for an eco-town (see the conclusions section).

Alternatives

3.2.11 Under the SEA Directive, *“Where an environmental assessment is required... an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or Programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or Programme, are identified, described and evaluated...”* (our emphasis).

3.2.12 The SA and HRA of the Eco-towns Programme focused primarily on the 15 shortlisted locations. However, in some cases the relevant local planning authority suggested an alternative location – either through the consultation process or in discussions with Communities and Local Government and Scott Wilson. Where this alternative was deemed to fulfil the broad eco-town criteria, ie a distinct new settlement of 5000 plus dwellings with a range of employment opportunities and where the proposal was in the vicinity of one of the 15 shortlisted sites, then this alternative was also subject to SA and HRA. For example, the Greater Norwich Development Partnership (comprising Norwich City Council, Broadland District Council, South Norfolk Council, Norfolk County Council and the Broads Authority) proposed Rackheath as an alternative to the shortlisted location of Coltishall and this was also subject to SA and HRA. The rationale for including alternative locations was to assist Communities and Local Government in deciding which of the shortlisted locations to take forward. However, no conclusion as to the possibility of an alternative being taken forward by Communities and Local Government should be drawn from its inclusion in the SA.

3.2.13 Furthermore, those locations banded C or above in the cross-government review (see section 2.3) but not taken forward were also subject to SA and HRA where they were located in the vicinity of a shortlisted location and thus provided a reasonable alternative. For example, the proposals for eco-towns at Alconbury and Waterbeach were both graded C in the cross-government review but were not shortlisted; they have, however, been included as reasonable alternatives to the shortlisted location of Hanley Grange.

3.2.14 Finally, some additional proposals were made by project proponents and their agents in response to the consultation on *Eco-towns: Living a greener future*¹⁴. Again where such proposals fulfilled the eco-towns criteria and were in the vicinity of the 15 shortlisted locations, they were included in the SA and HRA.

¹⁴ Communities and Local Government (2008). *Eco-towns: Living a greener future – consultation* [online] www.communities.gov.uk/publications/housing/ecotownsgreenerfuture (accessed 5 August 2008).

3.2.15 Table 6 sets out the grades assigned to each of the original bids as a result of the cross-government review and whether or not they were included or excluded from the SA and HRA. Table 7 sets out the additional proposals received following the *Living a greener future* consultation and, again, whether or not they were included or excluded from the SA and HRA. Table 8 summarises the alternatives considered in the SA and HRA.

Table 5: Meeting the requirements of the SEA Directive

Questions for each shortlisted location/reasonable alternative	Key requirement of the SEA Directive (the 'environmental report' must include...)	Where can this be found in the report?
What's the objective of the proposal?	<i>"an outline of the contents, main objectives of the plan or Programme and relationship with other relevant plans and Programmes"</i> (Annex I(a))	Section 2.2 in each locational chapter
What's the policy context?	<i>"an outline of the contents, main objectives of the plan or Programme and relationship with other relevant plans and Programmes"</i> (Annex I(a))	Section 2.3 in each locational chapter
What are the key sustainability objectives we need to consider?	<i>"the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or Programme and the way those objectives and any environmental considerations have been taken into account during its preparation"</i> (Annex I(e)) ¹⁵	Section 2.4 in each locational chapter
What's the situation now? (including any existing problems)	<i>"the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or Programme"</i> (Annex 1(b)) <i>"the environmental characteristics of areas likely to be significantly affected"</i> (Annex I(c)) <i>"any existing environmental problems which are relevant to the plan or Programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC"</i> [NB problems relating to European sites are addressed through the HRA] (Annex I(d))	Section 2.5 in each locational chapter

¹⁵ Note that *"the way those objectives and any environmental considerations have been taken into account during its preparation"* is addressed in Section 3 for the Draft PPS and in each locational chapter

Table 5: Meeting the requirements of the SEA Directive (*continued*)

Questions for each shortlisted location/reasonable alternative	Key requirement of the SEA Directive (the 'environmental report' must include...)	Where can this be found in the report?
What will be the situation <i>without</i> the Eco-town? (the 'business-as-usual' option)	<i>"the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or Programme"</i> (Annex I(b))	Section 2.6 in each locational chapter
What will be the situation <i>with</i> the Eco-town?	<i>"the likely significant effects (1) on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors</i> [our emphasis] <i>(1) These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects"</i> (Annex I(f))	Section 2.7 in each locational chapter Cumulative effects are discussed in a separate conclusions section
How can we mitigate/enhance effects? (Scott Wilson's recommendations)	<i>"the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or Programme"</i> (Annex I(g))	Section 2.8 in each locational chapter
How should we monitor sustainability impacts?	<i>"a description of the measures envisaged concerning monitoring..."</i> (Annex I(i))	Section 2.9 in each locational chapter
Rationale for the alternatives looked at	<i>"an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information"</i> (Annex I(h))	Paragraphs 3.2.11 – 3.2.15 and Tables 6, 7 and 8 in this report
Difficulties encountered	<i>"an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information"</i> (Annex I(h))	Paragraph 3.2.18 – 3.2.19 in this report

Table 6: Eco-town proposals, performance in the cross-government review and status in the SA and HRA

Region	Eco-town location	Grade	Status in the SA and HRA
East Midlands	Manby	A/B	Included as shortlisted location
East Midlands	Groveswood (with WM)	C	Excluded because does not constitute a reasonable alternative, in geographical terms, to any shortlisted location
East Midlands	Pennbury	B/C	Included as shortlisted location
East Midlands	Kingston	C	Included as a possible location within Rushcliffe
East Midlands	Burtoft	E	Excluded because of grading
West Midlands	Curborough	C	Included as shortlisted location
West Midlands	Middle Quinton	B/C	Included as shortlisted location
West Midlands	Throckmorton	D/E	Excluded because of grading
South West	St Austell	A/B	Included as shortlisted location
North East	Cambois	C/D	Excluded because of grading
North East	Causey Park	C/D	Excluded because of grading
North East	Elton Park	F	Excluded because of grading
North West	Wardle	C	Excluded because does not constitute a reasonable alternative, in geographical terms, to any shortlisted location
North West	Carrington	D/E	Excluded because of grading
North West	West Cumbria	E	Excluded because of grading
Yorkshire and the Humber	Micklefield	C	Considered in the context of the local review for the Leeds City Region
Yorkshire and the Humber	Rossington	C	Included as shortlisted location
Yorkshire and the Humber	Darrington	C	Considered in the context of the local review for the Leeds City Region
Yorkshire and the Humber	Willow Green	B/E	Included as a possible location within the Leeds City Region
Yorkshire and the Humber	Thorp Arch	E	Excluded because of grading
Yorkshire and the Humber	The Greens	F	Excluded because of grading
Yorkshire and the Humber	Clifton Moor	F	Excluded because of grading
Yorkshire and the Humber	Hatfield	E	Excluded because of grading
Yorkshire and the Humber	Leeds City Region	n/a	Included as potential area of search (NB included Willow Green)
East of England	North East Elsenham	B/C	Included as shortlisted site
East of England	Marston Vale	B/C	Included as shortlisted site

Table 6: Eco-town proposals, performance in the cross-government review and status in the SA and HRA (continued)

Region	Eco-town location	Grade	Status in the SA and HRA
East of England	New Marston	B/C	Excluded in favour of Marston Vale following withdrawal
East of England	Hanley Grange	B	Included as shortlisted location
East of England	Alconbury	C	Included as reasonable alternative to Hanley Grange
East of England	Waterbeach	C	Included as reasonable alternative to Hanley Grange
East of England	Coltishall	C	Included as shortlisted location
East of England	MarksTey	D	Excluded because of grading
East of England	Six Mile Bottom	C/D	Excluded because of grading
East of England	Thamesgate	C/D	Excluded because of grading
East of England	Peterborough Airport	D	Excluded because of grading
East of England	Tattersett	E	Excluded because of grading
East of England	Easton Park	E	Excluded because of grading
East of England	Mereham	C	Not considered since the planning application had been called-in
East of England	Thurleigh Airfield	E	Excluded because of grading
East of England	Thorpe Woods	F	Excluded because of grading
East of England	Boxted Wood	F	Excluded because of grading
East of England	Harlow North	F	Excluded because of grading
East of England	Tilbury	F	Excluded because of grading
East of England	N Weald	D	Excluded because of grading
South East	Ford	C	Included as shortlisted location
South East	Whitehill-Bordon	B/C	Included as shortlisted location
South East	Greenway	B/C	Excluded because does not constitute a reasonable alternative, in geographical terms, to any shortlisted location
South East	Weston Otmoor	C	Included as shortlisted location
South East	Shipton	C	Included as a reasonable alternative to Weston Otmoor
South East	Micheldever	C/D	Excluded because of grading
South East	Airtrack	E	Excluded because of grading
South East	Redhill	E	Excluded because of grading
South East	Sittingbourne	E	Excluded because if grading
South East	Banstead	F	Excluded because of grading
South East	Dunsfold Park	F	Excluded because of grading
South East	Westcott	F	Excluded because of grading

Note: 57 bids reduced to 56 as Ford Airfield and Ford Enterprise Hub combined their proposals.

Table 7: Proposals arising from the Living a greener future consultation and status in the SA and HRA

Region	Eco-town location	Proponent	Status in SA and HRA
East Midlands	Newton-Bingham	Crown Estates Defence Estates Newton Nottingham LLP	Broadly fulfils eco-town criteria and within Rushcliffe area of search. Included.
East Midlands	Cotgrave Place	Banks	Broadly fulfils eco-town criteria and within Rushcliffe area of search. Included.
East of England	Rackheath	Greater Norwich Development Partnership	Close to Norwich but has scale and potential to fulfil eco-town criteria. Included.
East of England	Abington	Cambridge Delivery Partnership	Proposal considered insufficiently worked up for inclusion in the SA and HRA. However, it is considered to broadly fulfil the eco-towns criteria.
South East	Milton Common	East of Oxford Consortium	Proposal considered insufficiently worked up for inclusion in the SA and HRA. However, it is considered to broadly fulfil the eco-towns criteria.
South East	North West Bicester	Cherwell District Council	Close to Bicester and originally conceived as a, smaller, urban extension. Included as could be further developed to meet eco-town criteria.
Yorkshire and the Humber	Aire Valley	Leeds City Region	Of appropriate scale but involves redevelopment within established urban area. Excluded as unlikely to meet eco-town criteria.
Yorkshire and the Humber	North West York	Leeds City Region	Excluded as unlikely to meet eco-town criteria.
Yorkshire and the Humber	Bradford-Shipley Corridor	Leeds City Region	Excluded as unlikely to meet eco-town criteria.
Yorkshire and the Humber	North Kirklees	Leeds City Region	Excluded as unlikely to meet eco-town criteria.

Table 8: Locations considered in the SA and HRA of the Eco-towns Programme

Shortlisted location	Alternative(s) considered	Source of alternative(s)
Pennbury (Stoughton)	N/A	
Middle Quinton	N/A	
Bordon-Whitehill	N/A	
Weston Otmoor	Shipton	One of the original 57 bids – Graded C in the cross-Government review
	North West Bicester	Proposed by Cherwell District Council
Ford	N/A	
St Austell (China Clay Community)	N/A	
Rossington	N/A	
Hanley Grange	Alconbury	One of the original 57 bids – Graded C in the cross-Government review
	Waterbeach	One of the original 57 bids – Graded C in the cross-Government review
Marston Vale	N/A	
North East Elsenham	N/A	
Rushcliffe (Nottinghamshire)	Kingston	The Kingston eco-town was one of the original 57 bids but was not shortlisted. However, Rushcliffe Borough Council was identified by Communities and Local Government as a broad geographical area suitable for an eco-town and therefore included in the <i>Living a greener future</i> consultation document. Following the identification of Rushcliffe as a suitable area, proposals were submitted by developers for two sites: Former Newton-Bingham and Cotgrave Place.
	Newton-Bingham	
	Cotgrave Place	
Greater Norwich (Coltishall)	Rackheath	Proposed by the Greater Norwich Development Partnership
Curborough	N/A	
Manby	N/A	
Leeds City Region	Burn Airfield	Following the launch of the Eco-towns Prospectus, a proposal was put forward by Leeds City Region Leaders for further review of potential for eco-town locations, with the area of search focused on Leeds, York, Selby and Wakefield. Four alternative locations in the vicinity of Selby were proposed and each of these has been subject to SA and HRA. Subsequently, Leeds City Region local authorities resolved not to endorse any of the standalone eco-town locations, but to pursue the potential for applying eco-town standards in large scale urban edge sites in Leeds, York, Bradford and North Kirklees. These sites are outside the full eco-towns criteria for the purpose of this SA but Communities and Local Government is exploring this option separately with the local authority.
	Church Fenton	
	Gascoigne Wood	
	Willow Green	

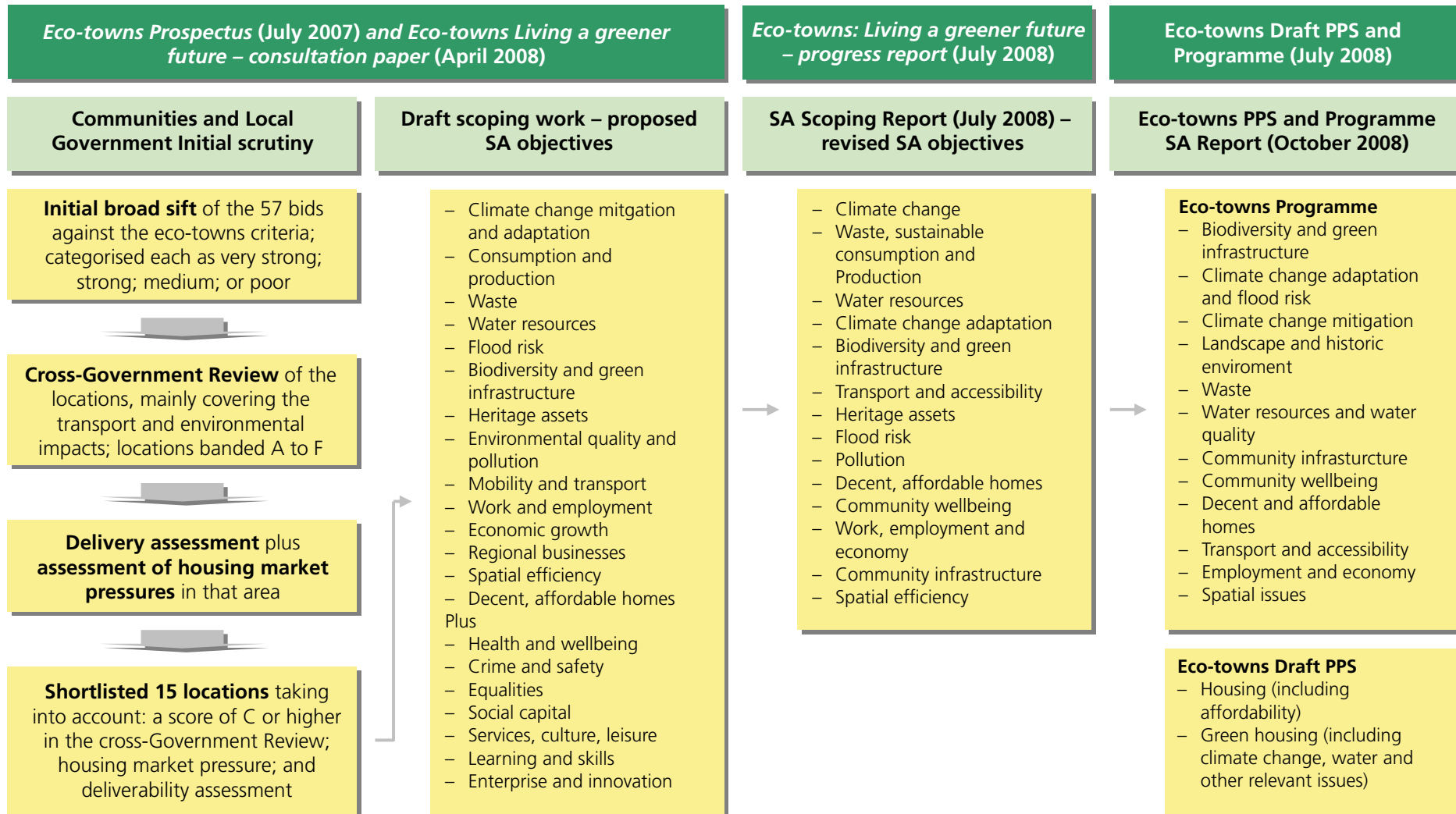
Scope of the appraisal

3.2.16 SA should focus on the economic, social and environmental impacts associated with an initiative and the SEA Directive suggests a range of topics which the assessment might focus on (such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape). In undertaking the SA of the Eco-towns Programme we have focused on a wide range of sustainability-related issues (see locational chapters for the full set of indicators associated with these):

- Biodiversity and green infrastructure
- Climate change adaptation and flood risk
- Climate change mitigation
- Landscape and historic environment
- Waste
- Water resources and water quality
- Community infrastructure
- Community wellbeing
- Decent and affordable homes
- Transport and accessibility
- Employment and economy
- Spatial issues

3.2.17 Figure 3 summarises the assessment and SA process that the proposed eco-town locations have undergone.

Figure 3: Overview of the assessment and the SA process for the eco-town locations



Difficulties encountered

- 3.2.18 The SEA Directive requires an acknowledgement of any difficulties – such as technical deficiencies or lack of know-how – encountered in undertaking the assessment and in compiling the required information. In this case, a considerable debate was had over the degree to which the SA should consider the sustainability merits of the proposed development as well as the location itself. In the event, it was decided that the SA should focus primarily on the location (which is fixed, notwithstanding the need to ultimately settle on a precise boundary for the development) but refer to the development proposals as appropriate (recognising that the current proposals for development at the various locations can obviously be modified and doubtless will be as time goes on). Reference to the development itself was considered important in gauging sustainability impacts particularly since the development could potentially mitigate impacts associated with the location and make the most of any locational opportunities. It should be noted that the development proposals for the various locations were at different stages of development at the time of the appraisal with some more advanced than others (and entirely absent for some of the alternatives); for this reason, the SA is at times uneven across the locational chapters in terms of the level of detail entered into.
- 3.2.19 Accurately predicting impacts at the strategic level is inherently challenging and the evidence base available at the time of the appraisal was not the same for each of the different locations (for example, the transport assessments for the shortlisted locations were not necessarily complete). In light of this, the appraisal necessarily took a discursive approach, highlighting the benefits and disbenefits, opportunities and challenges associated with each location and the associated development proposal. However, it should be noted that further appraisal work will be undertaken for those locations taken forward and this will provide an opportunity to progressively strengthen and augment the evidence base and explore impacts in greater detail.

Further sustainability appraisal and environmental assessment

- 3.2.20 The SA has been undertaken at a strategic level and is therefore necessarily broad in its assessment, conclusions and recommendations. It constitutes the first of a series of successive assessments that will be undertaken for each of the eco-towns that are taken forward. As each tier of the planning system is negotiated and the eco-town proposals are further developed, a new and more detailed assessment will be required. For example, where the eco-town is included in an LDF, the proposal will be subject to SA and reappraised in the light of more detailed information that may be available and further mitigation measures may also be suggested. Planning applications for eco-towns will also need to include a detailed Environmental Impact Assessment (EIA) which will, in turn, also suggest detailed mitigation measures.

3.3 HRA process and methodology

HRA process

- 3.3.1 The Conservation (Natural Habitats &c) (Amendment) Regulations, which implement the Habitats Directive¹⁶, require that an ‘Appropriate Assessment’ is undertaken for certain land use plans that are likely to have a significant effect on European sites¹⁷ – see Box 2.

Box 2: The legislative basis for ‘Appropriate Assessment’

Habitats Directive

Article 6 (3) states that:

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.”

Conservation (Natural Habitats &c. Regulations) 1994 (as amended)

Regulation 48 states that:

“A competent authority, before deciding to ... give any consent for a plan or project which is likely to have a significant effect on a European site ... shall make an appropriate assessment of the implications for the site in view of that site’s conservation objectives ... The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site”.

- 3.3.2 The process of implementing the assessment requirements of Regulation 48 is now generally referred to as a Habitats Regulations Assessment (HRA) and such an assessment has been undertaken for the Eco-towns Programme (and the Draft PPS). It is important to note that the objective of the HRA was not to devise detailed site-specific avoidance or mitigation measures that would definitively enable each of the potential eco-towns to avoid adverse effects on European sites; instead the aim was to use an assessment of the potential eco-town locations as a tool to determine whether the policies and standards in the Draft PPS provided sufficient direction (in terms of both scope and detail) to enable both these and future eco-towns to deliver the detailed site-specific measures necessary to avoid or mitigate an adverse effect.

¹⁶ Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the ‘Habitats Directive’)

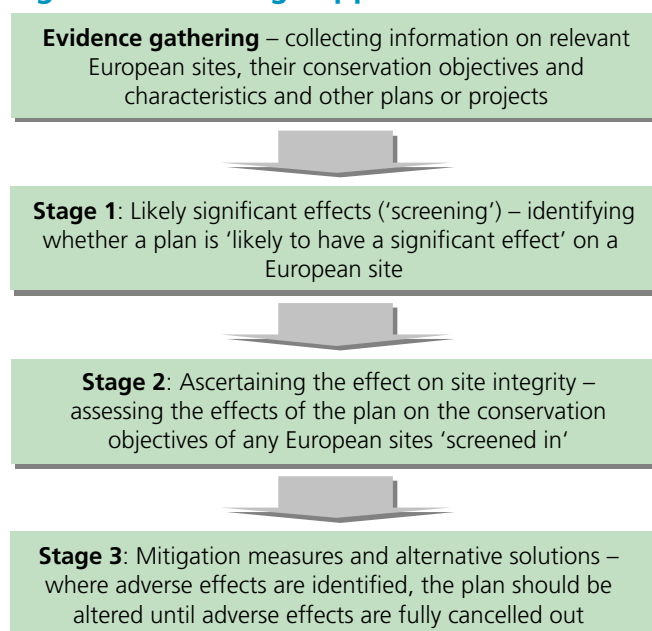
¹⁷ Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and, as a matter of government policy when applying the regulations, Ramsar sites.

- 3.3.3 The HRA of the Draft PPS takes place at the highest possible strategic level and is therefore necessarily broad in its assessment, conclusions and recommendations. It constitutes the first of a series of successive HRAs that will be undertaken for each potential eco-town. As each tier of the planning system is negotiated and the eco-town proposals are further developed, a new and more detailed HRA will be required.
- 3.3.4 Where an eco-town is part of a local authority's housing allocation, the HRA(s) of the Local Development Framework will reappraise the proposal in the light of more detailed information that may be available and incorporate their own mitigation or avoidance measures (many of which are likely to fall within the parameters set by the HRA of the Draft PPS). At the finest level of detail, planning applications for each eco-town will, where appropriate, also need a detailed HRA which will demonstrate how any necessary mitigation measures will be delivered on the ground. This will enable any amendments to the schemes to be taken into account and mitigation and avoidance measures to be refined, as they progress through the planning system.

HRA methodology

- 3.3.5 Figure 4 outlines the stages of HRA according to current draft Communities and Local Government guidance¹⁸. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

Figure 4: Four-stage approach to HRA



¹⁸ Communities and Local Government (2006). *Planning for the Protection of European Sites: Appropriate Assessment – Guidance for Regional Spatial Strategies and Local Development Documents* [online] www.communities.gov.uk/archived/publications/planningandbuilding/planning2 (accessed 12 August 2008).

Evidence gathering

- 3.3.6 Annex I to this report profiles each of the Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) which could conceivably be impacted on by development at the shortlisted locations and reasonable alternatives as appropriate. These profiles include their ecological features; the reasons for their designation; the condition status of their constituent Sites of Special Scientific Interest; and the environmental conditions necessary to maintain their integrity. European sites were scoped into the HRAs for each potential eco-town location using the distance criteria set out in sections 4.2 to 4.6 or – particularly when considering water resource and quality issues – as a result of the identification of a pathway linking the eco-town location with a European site even where the distances involved were considerable.
- 3.3.7 There are substantial practical difficulties that must be borne in mind when undertaking an HRA of any land use plan and particularly at this very strategic level. These are mainly concerned with the issue of recreational pressure. For all the European sites considered within the HRA, we first tried to obtain data that would enable us to impartially define the recreational catchment for the site but rapidly discovered that while some Natura 2000 sites (eg Rutland Water, Epping Forest, Ashdown Forest, Thames Basin Heaths, The New Forest and Cannock Chase) do have visitor surveys that include good information on recreational catchments, for the vast majority of sites no visitor surveys (as opposed to anecdotal observations) exist. Even where visitor surveys are undertaken they rarely report the data needed for an assessment of recreational impacts from surrounding developments, such as the average distance people travel to visit the site.
- 3.3.8 In the absence of European site visitor catchments and, since we obviously wanted to address the issue, it was decided to approach the issue from the opposite angle and try to define typical recreational catchments for new developments as a proxy measure in order to ensure that assessments were impartial and minimised bias due to personal opinion or anecdotal observation. Any proxy measure chosen would need to:
- use data collected in a highly systematic manner from a relatively large survey population which is subject to statistical analysis
 - contain some indication of distances travelled
 - make some form of distinction between different types of site (eg coastal, woodland etc)
 - avoid confining itself to holidaymakers but also cover day trippers
 - have some element of ‘proportion’ ie the data report the activities of a ‘typical’ respondent and therefore avoid extremes of behaviour.

- 3.3.9 The 'England Leisure Day Visits' data (which was based on a phone poll of 23,500 respondents) was considered to satisfy these requirements reasonably well. It is acknowledged that the England Leisure Day Visits survey is a simplistic assessment tool that does not take account of specific patterns of activity on those European sites that are not believed to fit the generalised model, but in the absence of site specific data it is preferable to failing to address the issue altogether or relying on subjective opinions. Moreover, for most European sites it is probably an overstatement since the majority of residents will, in reality, rarely travel far from their very local area for recreational purposes.
- 3.3.10 In practice, the gaps in the data regarding most European sites means that precise differences in distance cannot be detected by the assessment tools currently available to evaluate recreational pressure at this scale. For example, distinguishing between the effects of a development situated 15km away from a given European site and one situated 17km away would require detailed site-specific visitor data for the European site. In reality, even the most detailed visitor surveys (with the possible exception of those for some heathland sites) do not currently go into this level of detail.

Stage 1 – Likely significant effects

- 3.3.11 The first stage of any HRA is a likely significant effect (LSE) test – essentially a risk assessment to decide whether the subsequent stage known as Appropriate Assessment is required. The essential question is: *“Is the Eco-towns Programme, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?”*
- 3.3.12 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites (ie a 'cause-and-effect' pathway).
- 3.3.13 In this case, the programme as a whole (ie the shortlisted locations and reasonable alternatives as appropriate) has been evaluated within the context of existing knowledge of the various ways in which development can impact on European sites, accumulated from carrying out HRAs across the country at all geographical scales (from individual projects through to RSSs). If it cannot be concluded with confidence that adverse effects are unlikely, we have deferred to the precautionary principle and assumed that they require investigation through Appropriate Assessment. In this case, the shortlisted locations and the reasonable alternatives cannot be screened out and a full Appropriate Assessment has been undertaken.

Stages 2 and 3 – Appropriate Assessment and mitigation

3.3.14 When a plan cannot be 'screened out' on the basis of initial screening as being unlikely to lead to significant effects on European sites, it is necessary to progress to the later 'Appropriate Assessment' stage to explore the adverse effects and, where appropriate, devise mitigation measures. As stated above, full Appropriate Assessment was deemed necessary in this case. The steps involved are set out in Box 3 and further information on the assessment can be found in Section 4.

Box 3: Steps involved in the Appropriate Assessment

1. Determine possible impact pathways from the eco-town to European sites
2. Explore the reasons for the designation of these European sites and the environmental conditions required to maintain their integrity
3. Consider the eco-town within the context of the environmental processes – could the eco-town lead to an impact on any identified process?
4. Identify other plans and projects that might affect these European sites in combination with the eco-town
5. Decide if it is possible to determine that the eco-town would not have an adverse effect on European sites, even in combination with other projects/plans
6. If it is not possible to determine with confidence that the eco-town would not have an adverse effect, measures should be developed to avoid the effect entirely or to mitigate the impact sufficiently that its effect on the European site is rendered effectively inconsequential.

3.3.15 The level of detail available regarding future eco-town developments is insufficient to make a detailed quantification of adverse effects. Therefore, we have again taken a precautionary approach (in the absence of more precise data) assuming, as the default position, that if an adverse effect cannot be confidently ruled out, avoidance or mitigation measures must be provided. This is in line with government guidance that the level of detail of the assessment, whilst meeting the relevant requirements of the Habitats Regulations, should be 'appropriate' to the level of plan or project that it addresses¹⁹.

3.3.16 Where an alternative water supply strategy is likely but the details are unknown, we have deliberately avoided mentioning specific European sites since the list could theoretically be endless depending entirely upon which approach was taken.

¹⁹ Communities and Local Government (2006). *Planning for the Protection of European Sites: Appropriate Assessment – Guidance for Regional Spatial Strategies and Local Development Documents* [online] www.communities.gov.uk/archived/publications/planningandbuilding/planning2 (accessed 12 August 2008).

3.3.17 There have been several challenges in devising avoidance and mitigation measures as part of this HRA which we have had to address:

- When devising recommendations for mitigation and avoidance measures it is essential to bear in mind that these are recommendations for a PPS. As such they are constrained by the fact that individual PPS policies cannot be tailored to specific eco-towns but must be sufficiently general to cover all the shortlisted eco-towns and any future developments that will seek to acquire the 'eco-town' label
- For air quality, it is generally not possible to predict in advance the scale of improvement that can be delivered by a given mitigation measure for those measures which are available at the strategic planning level (eg requirement for a sustainable transport plan or the location of all homes within a 10-15 minute walk of core services)
- There are only certain mitigation measures that are within the remit of the PPS to deliver – for example, where we have identified that a new approach to water supply may be required for an eco-town, we have avoided making decisions over what alternative approach to water supply should be adopted since it is for the water companies to decide (in consultation with the Environment Agency and Regulator) on the ultimate approach to water supply. Furthermore, a direction over a specific water supply strategy would not be appropriate for inclusion within the PPS.

Other plans and projects that may act in combination

3.3.18 It is a requirement of HRA that plans are not evaluated in isolation but within the context of both prevailing environmental conditions and other plans or projects that may work together to affect the European sites in question. The assessment process therefore takes account of reasonably foreseeable impacts arising from both plans and projects and 'background' environmental changes or trends (eg sea-level rise as a result of climate change).

3.3.19 It is neither practical nor necessary to assess the ‘in combination’ effects of the Eco-towns Programme within the context of all other plans and projects across England. In practice, in combination assessment is only really of relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. For the purposes of this assessment, we have identified the following:

- Existing wastewater discharge consents and freshwater abstraction licences as appraised by the Environment Agency’s Review of Consents process and associated reports
- Housing allocations within LDF Core Strategies that are above the minimum levels set out in the Regional Spatial Strategy (RSS)
- Airport expansions (including Gatwick and Heathrow) in line with the needs of the Aviation White Paper and Civil Aviation Act
- RSSs for the English regions
- The Regional Economic Strategies for the relevant English regions.

3.3.20 In addition, reference was made to other documents where relevant. These included:

- Minerals and Waste Development Frameworks
- Shoreline Management Plans
- Coastal Habitat Management Plans; and
- Catchment Abstraction Management Strategies.

4 HRA: Likely significant effects

4.1 Introduction

4.1.1 In accordance with Stage 1 of the HRA process the following section details the screening – the Likely Significant Effect test – of the Eco-towns Programme and covers the possible impacts upon European sites that may result from the constituent eco-towns. The assessment of the impacts of specific eco-towns on specific European sites is contained in the HRA section of the locational chapters.

4.1.2 Development at the various eco-town locations could adversely impact on European sites as a result of:

- The effects of **urbanisation**
- **Recreational impacts**
- **Atmospheric pollution**
- Impacts on **water resources**
- Impacts on **water quality**.

4.1.3 Each of these issues is introduced below and the Appropriate Assessment of each shortlisted location is structured around these. Note that direct landtake was scoped out of the possible impacts as it was determined that none of the eco-town locations would directly impinge on European sites.

4.2 Urbanisation

4.2.1 This impact is closely related to recreational pressure (see below), in that both result from increased populations within close proximity to sensitive sites. Urbanisation is considered separately as the detail of the impacts is distinct from the trampling, disturbance and dog-fouling that results specifically from recreational activity. The list of urbanisation impacts can be extensive, but core impacts can be singled out:

- Increased fly-tipping – Rubbish tipping is unsightly but the principle adverse ecological effect of tipping is the introduction of invasive alien species with garden waste. Garden waste results in the introduction of invasive aliens precisely because it is the ‘troublesome and over-exuberant’ garden plants that are typically thrown out²⁰. Alien species may also be introduced deliberately or may be bird-sown from local gardens

²⁰ Gilbert, O. & Bevan, D. (1997). The effect of urbanisation on ancient woodlands. *British Wildlife* 8: 213-218

- Cat predation – A survey performed in 1997 indicated that nine million British cats brought home 92 million prey items over a five-month period²¹. A large proportion of domestic cats are found in urban situations, and increasing urbanisation is likely to lead to increased cat predation.

4.2.2 The most detailed consideration of the link between relative proximity of development to heathland European sites and damage to interest features has been carried out with regard to the Thames Basin Heaths SPA. After extensive research, Natural England and its partners produced a 'Delivery Plan' which made recommendations for accommodating development while also protecting the interest features of the European site. This included the recommendation to implement a series of zones within which varying constraints would be placed upon development. While the zones relating to recreational pressure expanded to 5km (as this was determined from visitor surveys to be the principal recreational catchment for this European site), that concerning other aspects of urbanisation (particularly predation of the chicks of ground-nesting birds by domestic cats) was determined at 400m from the SPA boundary. The delivery plan concluded that the adverse effects of any development located within 400m of the SPA boundary could not be mitigated since this was the range within cats could be expected to roam as a matter of routine and there was no realistic way of restricting their movements, and as such, no new housing should be located within this zone.

4.2.3 No exact correlation can be made between the incidence of fly-tipping and deliberate arson and the specific proximity of large-scale human settlement, since it obviously depends on circumstances. However, it is reasonable to conclude that the incidence will be highest when human settlement is very near (for the purposes of this assessment we have as a precaution defined 'very near' as being within 500m rather than immediately adjacent). While this is not an empirically derived distance, it does enable urbanisation effects to be assessed at this high level. These impacts would need to be evaluated in more detail when individual site proposals and masterplans were developed.

4.2.4 At least two of the shortlisted eco-towns (Whitehill-Bordon and St Austell) are located in close proximity to at least one European site each (Woolmer Forest SAC/Wealden Heaths Phase 2 SPA and St Austell Clay Pits SAC respectively). It was therefore concluded that adverse effects on European sites from the potential eco-towns as a result of urbanisation could not be described as unlikely and further investigation was required at the Appropriate Assessment stage.

²¹ Woods, M. *et al* (2003). Predation of wildlife by domestic cats *Felis catus* in Great Britain. *Mammal Review* 33(2): 174-188

4.3 Recreational impacts

- 4.3.1 All types of terrestrial European site, including woodlands, can be affected by trampling, which in turn causes soil compaction and erosion. Motorcycle scrambling and off-road vehicle use can cause more serious erosion, as well as disturbance to sensitive species.
- 4.3.2 Many wetland sites are extensively used for recreational activity by people from a wide-ranging catchment. Activities of walkers (particularly dog walkers) and water-borne recreation can, if carried out in winter, have a significant disturbing effect upon wintering waterfowl thus increasing energetic expenditure (as birds have to take flight more frequently) and competition on the less disturbed mudflats²².
- 4.3.3 The effects of recreation on heathland sites have been described in a series of recent English Nature Research Reports^{23,24,25,26,27,28}. It would appear that recreational pressure can have a significant adverse effect on the Annex I bird species for which the SPAs have been designated. Disturbance can have an adverse effect in various ways, with increased nest predation by natural predators as a result of adults being flushed from the nest and deterred from returning to it by the presence of people and dogs likely to be a particular problem. A literature review on the effects of human disturbance on bird breeding found that 36 out of 40 studies reported reduced breeding success as a consequence of disturbance²⁹. The main reasons given for the reduction in breeding success were nest abandonment and increased predation of eggs or young. Studies of other species have shown that birds nest at lower densities in disturbed areas, particularly when there is weekday as well as

²² West, A.D., *et al* (2002). Predicting the impacts of disturbance on shorebird mortality using a behaviour-based model. *Biological Conservation* 106(3): 319-328

²³ Liley, D. and R.T. Clarke (2002). Urban development adjacent to heathland sites in Dorset: the effect on the density and settlement patterns of Annex 1 bird species. *English Nature Research Reports*, No. 463. Peterborough: English Nature (now Natural England).

²⁴ Murison, G. (2002). The impact of human disturbance on the breeding success of nightjar *Caprimulgus europaeus* on heathlands in south Dorset, England. *English Nature Research Reports*, No. 483. Peterborough: English Nature (now Natural England).

²⁵ Land Use Consultants (2005). Going, going, gone? The cumulative impact of land development on biodiversity in England. *English Nature Research Reports*, No. 626

²⁶ Rose, R.J. and R.T. Clarke (2005). Urban impacts on Dorset Heathlands: Analysis of the heathland visitor questionnaire survey and heathland fires incidence data sets. *English Nature Research Reports*, No. 624. Peterborough: English Nature (now Natural England).

²⁷ Tyldesley, D. and associates (2005). Urban impacts on Dorset heaths: A review of authoritative planning and related decisions. *English Nature Research Reports*, No. 622. Peterborough: English Nature (now Natural England).

²⁸ Underhill-Day, J.C. (2005). A literature review of urban effects on lowland heaths and their wildlife. *English Nature Research Reports*, No. 623. Peterborough: English Nature (now Natural England).

²⁹ Hockin, D., M. Oundsted, M. Gorman, D. Hill, V. Keller and Barker, M.A. (1992). Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. *Journal of Environmental Management* 36: 253-286

weekend pressure³⁰. A number of studies have shown that birds are affected more by dogs and people with dogs than by people alone, with birds flushing more readily, more frequently, at greater distances and for longer³¹. In addition, dogs, rather than people, tend to be the cause of many management difficulties, notably by worrying grazing animals and causing eutrophication near paths. Nutrient-poor habitats such as heathland are particularly sensitive to the fertilising effect of inputs of phosphates, nitrogen and potassium from dog faeces³². Underhill-Day (2005) summarises the results of visitor studies that have collected data on the use of semi-natural habitat by dogs. In surveys where 100 observations or more were reported, the mean percentage of visitors who were accompanied by dogs was 54.0 per cent.

- 4.3.4 However these studies need to be treated with caution. For example, the effect of disturbance is not necessarily correlated with the impact of disturbance, ie the most easily disturbed species are not necessarily those that will suffer the greatest impacts. It has been shown that, in some cases, the most easily disturbed birds simply move to other feeding sites, whilst others may remain (possibly due to an absence of alternative sites) and thus suffer greater impacts on their population³³. A literature review undertaken for the RSPB³⁴ also urges caution when extrapolating the results of one disturbance study because responses differ between species and the response of one species may differ according to local environmental conditions. These facts have to be taken into account when attempting to predict the impacts of future recreational pressure on European sites.
- 4.3.5 It should be emphasised that recreational use is not inevitably a problem. Many European sites are also National Nature Reserves (eg Thursley Common) or nature reserves managed by wildlife trusts and the RSPB. At these sites, access is encouraged and resources are available to ensure that recreational use is managed appropriately.
- 4.3.6 Where increased recreational use is predicted to cause adverse impacts on a site, avoidance and mitigation should be considered. Avoidance of recreational impacts at European sites involves locating new development away from such sites; Local Development Frameworks (and other strategic plans) provide the mechanism for achieving this. Where avoidance is not possible, mitigation will usually involve a mix of access management, habitat management and the provision of alternative recreational space.

³⁰ Van der Zande, A.N., J.C. Berkhuisen, H.C. van Letesteyn, W.J. ter Keurs and Poppelaars, A.J. (1984). Impact of outdoor recreation on the density of a number of breeding bird species in woods adjacent to urban residential areas. *Biological Conservation* 30:1-39

³¹ Underhill-Day, J.C. (2005). A literature review of urban effects on lowland heaths and their wildlife. *English Nature Research Reports*, No. 623. Peterborough: English Nature (now Natural England).

³² Shaw, P.J.A., K. Lankey and S.A. Hollingham (1995). Impacts of trampling and dog fouling on vegetation and soil conditions on Headley Heath. *The London Naturalist* 74: 77-82

³³ Gill, J.A., Norris, K. & Sutherland, W.J. (2001). Why behavioural responses may not reflect the population consequences of human disturbance. *Biological Conservation* 97: 265-268

³⁴ Woodfield, E. & Langston, R. (2004). Literature review on the impact on bird population of disturbance due to human access on foot. *RSPB research report* No. 9

- Access management – restricting access to some or all of a European site – is not usually within the remit of the district or borough council and restriction of access may contravene a range of government policies on access to open space, as well as government objectives for increasing exercise, improving health etc. However, active access management may be possible, for example as practised on nature reserves.
- Habitat management is not within the direct remit of councils. However, councils can help to set a framework for improved habitat management by promoting cross-authority collaboration for example.
- Provision of alternative recreational space can help to divert recreational users away from sensitive European sites, and reduce additional pressure on them. Some species for which European sites have been designated are particularly sensitive to dogs, and many dog walkers may be happy to be directed to other, less sensitive, sites. However the location and type of alternative space must be attractive for users in order to be effective.

4.3.7 Concern regarding the effects of disturbance on wintering birds stems from the fact that they are expending energy unnecessarily and that the time they spend responding to disturbance is time that is not spent feeding³⁵. Disturbance of wintering birds therefore risks increasing energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately the survival of the birds at a time when food is scarce³⁶. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds³⁷.

4.3.8 Human activity can affect birds either directly (eg through causing them to flee) or indirectly (eg through damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (eg alterations in feeding behaviour, avoidance of certain areas etc) and physiological changes (eg an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death³⁸.

4.3.9 Recreational activity will often result in a flight response (flying, diving, swimming or running) from the animal that is being disturbed. This carries an energetic cost that requires a greater food intake. Relatively little detailed research has been conducted concerning the energetic cost to wildlife of

³⁵ Riddington, R., Hassall, M., Lane, S. J., Turner, P. A., and Walters, R. (1996). The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

³⁶ Madsen, J. (1995). Impacts of disturbance on migratory waterfowl. *Ibis* 137: 67-74

³⁷ Gill, J.A., Sutherland, W.J. & Norris, K. (1998). The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

³⁸ Riley, J. (2003). *Review of Recreational Disturbance Research on Selected Wildlife in Scotland*. Scottish Natural Heritage

disturbance, but such evidence as exists indicates a significant negative effect.

- 4.3.10 The potential for disturbance may be less in winter than in summer, in that there are often a smaller number of recreational users. However, winter activity can still cause important disturbance, especially as birds are particularly vulnerable at this time of year due to food shortages. Several empirical studies have demonstrated that out-of-season recreational activity can result in quantifiable disturbance.
- 4.3.11 Tuite *et al*³⁹ found that during periods of high recreational activity, bird numbers at Llangorse Lake decreased by 30 per cent as the morning progressed, matching the increase in recreational activity towards midday. During periods of low recreational activity, however, no change in numbers was observed as the morning progressed. In addition, all species were found to spend less time in their 'preferred zones' (the areas of the lake used most in the absence of recreational activity) as recreational intensity increased.
- 4.3.12 Underhill *et al*⁴⁰ counted waterfowl and all disturbance events at 54 water bodies within the South West London Water bodies Special Protection Area and clearly correlated disturbance with a decrease in bird numbers at weekends in smaller sites and with the movement of birds within larger sites from disturbed to less disturbed areas.
- 4.3.13 Evans & Warrington⁴¹ found that on Sundays total water bird numbers (including shoveler and gadwall) were 19 per cent higher on Stocker's Lake LNR in Hertfordshire and attributed this to observed greater recreational activity on surrounding water bodies at weekends relative to week days. However, recreational activity was not quantified in detail and individual recreational activities were not evaluated separately.
- 4.3.14 Tuite *et al*⁴² used a large (379 site), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They found that shoveler was one of the most sensitive species to disturbance. The greatest impact on winter wildfowl numbers was associated with sailing/windsurfing and rowing.

³⁹ Tuite, C. H., Owen, M. & Paynter, D. (1983). Interaction between wildfowl and recreation at Llangorse Lake and Talybont Reservoir, South Wales. *Wildfowl* 34: 48-63.

⁴⁰ Underhill, M.C. *et al* (1993). *Use of Waterbodies in South West London by Waterfowl: An Investigation of the Factors Affecting Distribution, Abundance and Community Structure*. Report to Thames Water Utilities Ltd and English Nature. Wetlands Advisory Service, Slimbridge.

⁴¹ Evans, D.M. & Warrington, S. (1997). The effects of recreational disturbance on wintering waterbirds on a mature gravel pitlake near London. *International Journal of Environmental Studies* 53: 167-182

⁴² Tuite, C.H., Hanson, P.R. & Owen, M. (1984). Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62.

- 4.3.15 Disturbing activities exist on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.
- 4.3.16 The key factors that influence a species response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity.
- 4.3.17 The distance at which a species takes flight when approached by a disturbing stimulus is known as the 'tolerance distance' (also called the 'escape flight distance') and differs between species to the same stimulus and within a species to different stimuli. Some distances for shoveler have been recorded. These are given in Table 9, which compiles 'tolerance distances' from across the literature.

Table 9: Tolerance distances of 21 water bird species to various forms of recreational disturbance^{43,44}

Species	Type of disturbance		
	Rowing boats/ kayak	Sailing boats	Walking
Little grebe		60 – 100 ¹	
Great crested grebe	50 – 100 ²	20 – 400 ¹	
Mute swan		3 – 30 ¹	
Teal		0 – 400 ¹	
Mallard		10 – 100 ¹	
Shoveler		200 – 400 ¹	
Pochard		60 – 400 ¹	

⁴³ As described in the literature. All distances are in metres. Single figures are mean distances; when means are not published, ranges are given. 1 Tydeman (1978), 2 Keller (1989), 3 Van der Meer (1985), 4 Wolff *et al* (1982), 5 Blankestijn *et al* (1986), 6 Cook (1980) (references below)

⁴⁴ ¹ Tydeman, C.F. (1978). *Gravel Pits as conservation areas for breeding bird communities*. PhD thesis. Bedford College

² Keller, V. (1989). Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance – a sign of adaptation? *Biological Conservation* 49:31-45.

³ Van der Meer, J. (1985). *De verstoring van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.

⁴ Wolf, W.J., Reijnders, P.J.H. & Smit, C.J. (1982). The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107

⁵ Blankestijn, S. *et al* (1986). *Seizoensverbreding in de recreatie en verstoring van Wulp en Scholkester op hoogwatervluchplaatsen op Terschelling*. Report Projectgroep Wadden, L.H. Wageningen. 261pp.

⁶ Cooke, A.S. (1980). Observation on how close certain passerine species will tolerate an approaching human in rural and suburban areas. *Biological Conservation* 18: 85-88.

Table 9: Tolerance distances of 21 water bird species to various forms of recreational disturbance^{43,44} (continued)

Species	Type of disturbance		
	Rowing boats/ kayak	Sailing boats	Walking
Tufted duck		60 – 400 ¹	
Goldeneye		100 – 400 ¹	
Smew		0 – 400 ¹	
Moorhen		100 – 400 ¹	
Coot		5 – 50 ¹	
Curlew			211 ³ ; 339 ⁴ ; 213 ⁵
Shelduck			148 ³ ; 250 ⁴
Grey plover			124 ³
Ringed plover			121 ³
Bar-tailed godwit			107 ³ ; 219 ⁴
Brent goose			105 ³
Oystercatcher			85 ³ ; 136 ⁴ ; 82 ⁵
Dunlin			71 ³ ; 163 ²
Dunnock			9.2 ⁶

4.3.18 Analysis of the latest England Day Visits Survey⁴⁵ indicates that people typically travel:

- 10.8 miles (17.2 km) to visit a countryside site for the day
- 11.3 miles (18.1 km) to visit a woodland site for the day
- 16 miles (25.5 km) to visit a coastal site for the day.

4.3.19 In all cases, more journeys were made by car. It should be noted that these are generalised figures; individual European sites may draw the majority of their visitors from a much smaller catchment (eg Thames Basin Heaths SPA, which draws 96 per cent of its visitors from within 5 km⁴⁶) or a much larger one (eg the New Forest SAC, for which 55 per cent of visitors are holidaymakers rather than locals⁴⁷).

⁴⁵ Natural England *et al* (2006). *England Leisure Visits: Report of the 2005 Survey* [online] [www.countryside.gov.uk/Images/ELVS/per cent20Brochure per cent20_tcm2-31642.pdf](http://www.countryside.gov.uk/Images/ELVS/per%20cent20Brochure/per%20cent20_tcm2-31642.pdf) (accessed 12 August 2008)

⁴⁶ Liley, D., Jackson, D.B. and Underhill-Day, J.C. (2005). *Visitor access patterns on the Thames Basin Heaths*. English Nature Research Report, No. 682. Peterborough: English Nature (now Natural England)

⁴⁷ Forestry Commission (2005). *New Forest Visitor Survey*

- 4.3.20 In the absence of more precise visitor surveys for the European sites considered in this assessment or an alternative methodology, we considered that it was both pragmatic and defensible to take the England Day Visits data as broadly 'typical' of the distances that eco-town residents may travel to visit European sites; this means that all of those sites within these distances could be affected by trampling or (in the case of Special Protection Areas) disturbance to sensitive wildlife.
- 4.3.21 Many of the shortlisted eco-towns lie within the average distances that were travelled by respondents to the England Day Visits Survey. It was therefore concluded that adverse effects on European sites from the potential eco-towns as a result of recreational pressure could not be described as unlikely and further investigation was required at the Appropriate Assessment stage.

4.4 Atmospheric pollution

- 4.4.1 Current levels of understanding of air quality effects on semi-natural habitats are not adequate to allow a rigorous assessment of the likelihood of significant effects on the integrity of key European sites. However, at a general level, many European sites are known to be subject to poor air quality – see Tables 10 and 11 for examples from southeast England.

Table 10: Air pollution deposition for 1999/2000 vs. critical load at SACs in South East England⁴⁸

Name	Deposition/critical load					
	Acid deposition	NH ₃	N deposition	NO	Low level ozone	SO ₂
Ashdown Forest	15.00*	0.11	1.12	0.64	1.67	0.14
Aston Rowant	0.47	0.16	1.05	0.91	1.40	0.18
Blean Complex	1.30	0.11	2.66	0.70	1.58	0.34
Bridlesford Copses	0.95	0.12	2.19	0.68	1.71	0.16
Burnham Beeches	1.93	0.16	2.89	1.15	1.47	0.20
Butser Hill	0.43	0.15	0.98	0.81	1.76	0.14
Castle Hill	0.44	0.24	1.05	0.79	1.73	0.14
Chilterns Beechwoods	2.23	0.16	3.55	0.88	1.46	0.18
Cothill Fen	19.90	0.25	0.89	0.96	1.29	0.23
Dorset Heaths	11.80	0.12	0.88	0.41	1.71	0.12
Dover to Kingsdown Cliffs		0.09	1.29	0.55		0.33
Duncton to Bignor Escarpment	0.22	0.11	2.43	0.63	1.78	0.13
Dungeness	0.37	0.10	1.18	0.44	1.58	0.26
East Hampshire Hangers	0.48	0.17	1.12	0.63	1.72	0.12
Ebernoe Common	1.03	0.15	2.57	0.57	1.63	0.12
Emer Bog	1.59	0.19	2.67	0.83	1.64	0.19
Folkestone to Etchinghill Esc.	0.46	0.14	0.93	0.75	1.56	0.31
Hackpen Hill	0.49	0.17	1.12	0.72	1.44	0.17
Hartslock Wood	0.45	0.19	1.03	0.93	1.39	0.16
Hastings Cliffs	2.17	0.12	1.34	0.55	1.68	0.24
Isle of Wight Downs	0.34	0.16	0.77	0.46		0.14
Kennet and Lambourn Floodplain	0.48	0.17	0.87	0.78	1.48	0.17
Kennet Valley Alderwoods	0.28	0.19	3.06	0.70	1.49	0.15
Kingley Vale	0.37	0.14	0.84	0.70	1.75	0.13

⁴⁸ Note that the critical load used is based on the dominant soil type in the 1km square in which the European site occurs. However, this may not be the most appropriate critical load to protect the conservation feature(s) for which the site has been designated. Based on information provided by the Air Pollution Information System (www.apis.ac.uk).

Table 10: Air pollution deposition for 1999/2000 vs. critical load at SACs in South East England⁴⁸ (continued)

Name	Deposition/critical load					
	Acid deposition	NH ₃	N deposition	NOx	Low level ozone	SO ₂
Lewes Downs	0.38	0.17	0.87	0.75	1.70	0.15
Little Wittenham	2.51	0.30	3.53	0.85	1.36	0.17
Lydden and Temple Ewell Downs	0.56	0.12	1.11	0.68	1.49	0.31
Mole Gap to Reigate Esc	0.43	0.12	0.96	0.96	1.61	0.16
Mottisfont Bats	1.14	0.16	2.63	0.69	1.62	0.13
North Downs Woodlands	0.27	0.11	2.64	1.08	1.62	0.28
Oxford Meadows	0.43	0.16	0.77	0.99	1.26	0.18
Parkgate Down	2.95	0.16	1.13	0.68	1.54	0.30
Peter's Pit	0.30	0.17	2.92	1.14	1.55	0.38
Queendown Warren	0.51	0.15	0.99	1.04	1.51	0.39
Rook Clift	1.61	0.14	2.69	0.68	1.70	0.12
Salisbury Plain	0.43	0.17	0.98	0.49	1.63	0.14
Sandwich Bay		0.10	1.08	0.61		0.38
Shortheath Common	19.80	0.17	3.00	0.72	1.61	0.15
Solent and Isle of Wight Lagoons		0.11	1.18	0.72		0.35
Solent Maritime		0.19	0.46	0.62		0.14
South Wight Maritime		0.14	1.20	0.39		0.13
Stodmarsh	1.20	0.11	0.71	0.66	1.37	0.33
Thanet Coast		0.07	1.18	0.59	1.29	0.41
The Mens	1.05	0.16	2.66	0.60	1.64	0.12
The New Forest	12.60	0.06	0.93	0.72	1.72	0.12
Thursley, Ash, Pirbright, Chobham	18.10	0.15	1.35	0.85	1.59	0.17
Windsor Forest and Great Park	2.34	0.21	3.11	1.45	1.47	0.33
Woolmer Forest	17.40	0.11	1.30	0.72	1.64	0.15
Wye and Crundale Downs	2.65	0.16	1.02	0.67	1.57	0.30

* Ashdown Forest was designated for its heathland, hence its sensitivity to acid deposition is like that of other heathlands, not broadleaf woodlands.

Key: deposition/critical load

<0.25	0.25-0.74	0.75-0.99	1-1.24	1.25-1.99	2-4.99	5+
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Table 11: Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO ₂ , NO _x and ammonia all contribute to acid deposition. Although future trends in sulphur emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased nitrogen emissions may cancel out any gains produced by reduced sulphur levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH ₃)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO ₂ and NO _x emissions to produce fine ammonium (NH ₄ ⁺) – containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue).	Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH ₃ is rapidly deposited, some of the most acute problems of NH ₃ deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides (NO _x)	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO ₃), nitrogen dioxide (NO ₂) and nitric acid (HNO ₃) can lead to both soil and freshwater acidification. In addition, NO _x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO _x and NH ₃ emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, eg drought and frost.
Ozone (O ₃)	A secondary pollutant generated by photochemical reactions from NO _x and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O ₃ above 40 ppb can be toxic to humans and wildlife, and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.

Table 11: Main sources and effects of air pollutants on habitats and species
(continued)

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO ₂)	Main sources of SO ₂ emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO ₂ emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO ₂ acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

- 4.4.2 The main pollutants of concern for European sites are oxides of nitrogen (NO_x), ammonia (NH₃) and sulphur dioxide (SO₂). NO_x can have a directly toxic effect upon vegetation. In addition, greater NO_x or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats, such as heathlands. Sulphur dioxide deposition can lead to acidification of calcareous or mesotrophic habitats and thus a change in their species composition away from calcicolous plant species and towards those which are more typical of acidic habitats.
- 4.4.3 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO₂ or NH₃ emissions will be associated with eco-towns. NO_x emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Within a 'typical' housing development, by far the largest contribution to NO_x (92 per cent) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8 per cent) in comparison⁴⁹. Emissions of NO_x could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the eco-towns.
- 4.4.4 According to the World Health Organisation, the critical NO_x concentration (critical threshold) for the protection of vegetation is 30 µgm⁻³ while the threshold for sulphur dioxide is 20 µgm⁻³. In addition, ecological studies have determined 'critical loads'⁵⁰ of atmospheric nitrogen deposition (that is, NO_x combined with ammonia NH₃).

⁴⁹ Proportions calculated based upon data presented in Dore CJ *et al* (2005). *UK Emissions of Air Pollutants 1970 – 2003*. UK National Atmospheric Emissions Inventory [online] available at: <http://www.airquality.co.uk/archive/index.php> (accessed 12 August 2008).

⁵⁰ The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

4.4.5 The National Expert Group on Transboundary Air Pollution (2001)⁵¹ concluded that:

- In 1997, critical loads for acidification were exceeded in 71 per cent of UK ecosystems. This was expected to decline to 47 per cent by 2010
- Reductions in SO₂ concentrations over the last three decades have virtually eliminated the direct impact of sulphur on vegetation
- By 2010, deposited nitrogen was expected to be the major contributor to acidification, replacing the reductions in SO₂
- Current nitrogen deposition is probably already changing species composition in many nutrient-poor habitats, and these changes may not readily be reversed
- The effects of nitrogen deposition are likely to remain significant beyond 2010
- Current ozone concentrations threaten crops and forest production nationally. The effects of ozone deposition are likely to remain significant beyond 2010
- Reduced inputs of acidity and nitrogen from the atmosphere may provide the conditions in which chemical and biological recovery from previous air pollution impacts can begin, but the timescales of these processes are very long relative to the timescales of reductions in emissions.

4.4.6 Research by AEA Technology suggests that background air quality throughout the UK will improve very significantly over the next 10-15 years, primarily as a result of tightening Euro emission standards for cars and lorries and cleaner energy generation⁵². However, the model used does not include the higher housing figures being proposed in various RSSs, nor recent government proposals for new power stations (for instance it assumes that the number of fossil fuel burning power stations will decrease from 23 in 2005 to 12 in 2010 and 5 in 2020). A recent Defra study⁵³ also suggests that assumptions about vehicle emissions should add 15 per cent to Euro emission standards to take account of real-world effects such as

⁵¹ National Expert Group on Transboundary Air Pollution (2001). *Transboundary Air Pollution: Acidification, Eutrophication and Ground-Level Ozone in the UK* [online] www.maposda.net/negtap/finalreport.htm (accessed 13 August 2008).

⁵² Grice, S. et al (2006). *Baseline projections of air quality in the UK for the 2006 review of the Air Quality Strategy*, report to Defra et al [online] www.airquality.co.uk/archive/reports/cat16/0604041040_baselineprojectionsreport5.pdf (accessed 14 May 2008); and Grice, S. et al. (2007). *Updated projections of air quality in the UK for base case and additional measures for the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007*, report to Defra et al [online] www.airquality.co.uk/archive/reports/cat17/0707171116_newbaselineandadditionalmeasuresreport_v6.pdf (accessed 14 May 2008).

⁵³ Defra (2007). *Passenger transport emissions factors: Methodology paper* [online] www.defra.gov.uk/environment/business/envrp/pdf/passenger-transport.pdf (accessed 14 May 2008).

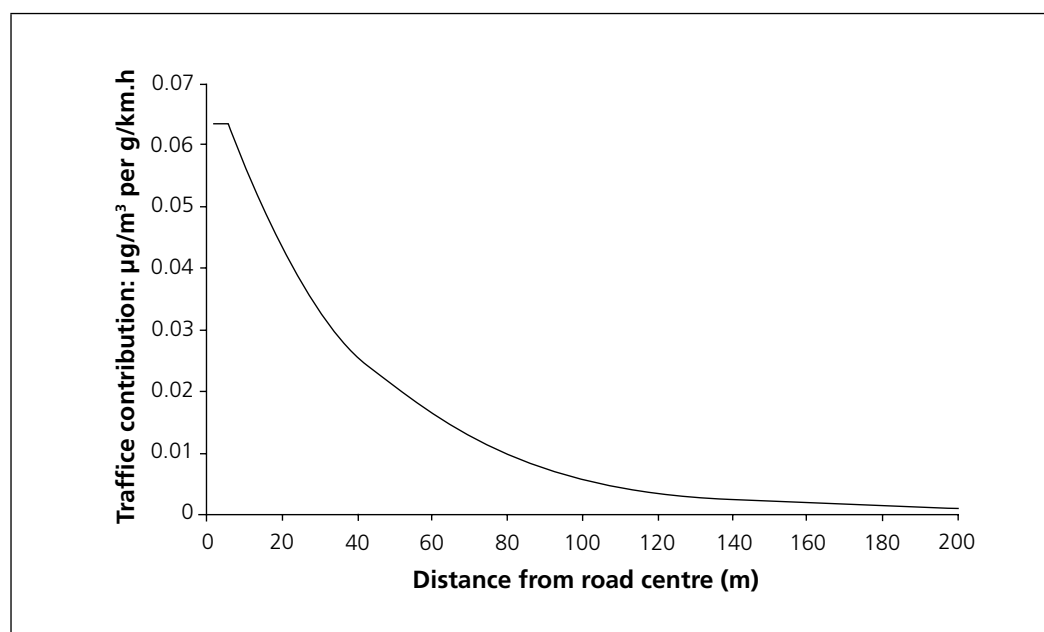
poor maintenance, low tyre pressure, poor driving, and increasing use of air conditioning. Defra's Air Quality Expert Group (2007) "recommends that local authorities, and any other users of the future-year adjustment factors, currently provided by Defra to adjust monitoring data, should exercise caution, as actual decreases in NO_2 concentrations at some sites may be considerably smaller than those calculated using these adjustment factors"⁵⁴.

- 4.4.7 For the purposes of this assessment, air quality impacts are divided into local and diffuse (or pan-regional) to reflect the two broad scales at which eco-towns could impact on air quality.

Local air pollution

- 4.4.8 These are associated with the precise location of development. According to the Department for Transport's Transport Analysis Guidance, "Beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant"⁵⁵ (see also Figure 5).

Figure 5: Traffic contribution to pollution at different distances from the road centre⁵⁶



⁵⁴ Air Quality Expert Group (2007). *Trends in primary nitrogen dioxide in the UK* [online] www.defra.gov.uk/environment/airquality/publications/primaryno2-trends/pdf/executive-summary.pdf (accessed 7 July 2008)

⁵⁵ Department for Transport (2003). *Transport Analysis Guidance (TAG) – The Local Air Quality Sub-objective, TAG Unit 3.3.3* [online] www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf (accessed 13 August 2008).

⁵⁶ Department for Transport (2007). *Design Manual for Roads and Bridges: Volume 11 – Environmental Assessment, Section 2, Part 1 Air Quality* [online] www.standardsforhighways.co.uk/dmr/vol11/section3/ha20707.pdf (accessed 13 August 2008).

4.4.9 We have therefore worked on the basis that if the potential eco-town and associated local roads that may be reasonably expected to experience a substantial increase in traffic as a result of the development do not lie within 200m of a European site, the contribution of that eco-town to local atmospheric nitrogen deposition at European sites is likely to be sufficiently small as to be effectively inconsequential, even when considered in combination with other local developments. This distance has therefore been used throughout the assessment in order to determine whether European sites are likely to be significantly affected at a local scale by development under the Eco-towns Programme.

Diffuse air pollution

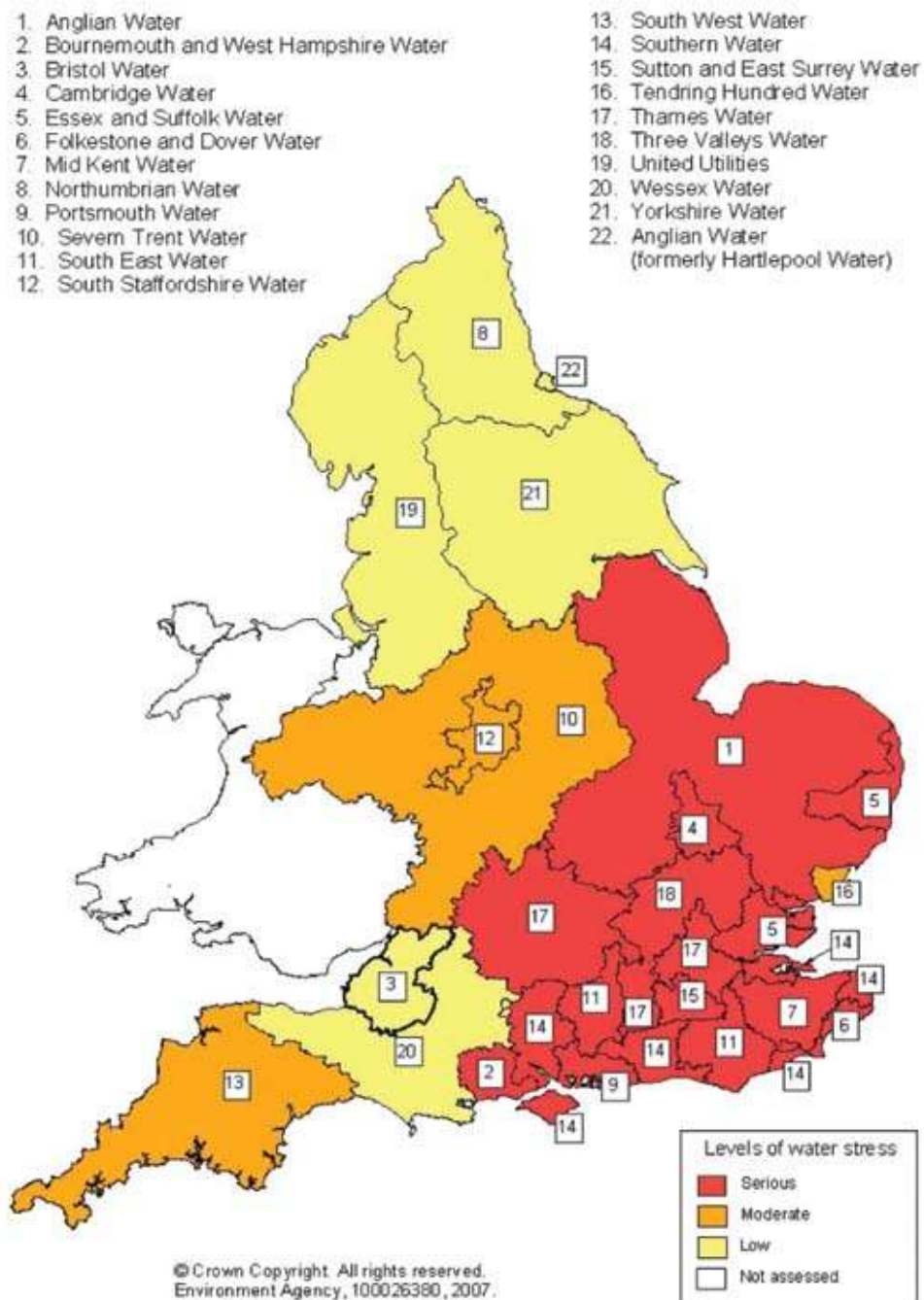
4.4.10 In addition to the contribution to local air quality issues, development can also contribute cumulatively to an overall deterioration in background air quality across an entire region or larger area. Equally, eco-town residents can be expected to occasionally travel throughout the country and therefore may periodically drive within 200m of a European site elsewhere but there are major technical difficulties with attempting to quantify the scale of impact. While it is considered reasonable to conclude that diffuse pan-authority air quality impacts are not appropriate to sub-regional documents such as LDFs, a national, strategic document such as the Eco-towns Programme does operate at a scale relevant to this issue. We have concluded that this is best addressed by considering it as a cumulative increase in the national car fleet and reporting it in an overall section on pan-regional diffuse air quality (section 4.8) that covers all the possible eco-towns as a single unit.

4.4.11 At least one of the short-listed eco-towns (Whitehill-Bordon) lies close to at least one European site (Woolmer Forest SAC/Wealden Heaths Phase 2 SPA) that is crossed by several major roads, while the other eco-towns will inevitably contribute to an overall change in diffuse air quality. It was therefore concluded that adverse effects on European sites from the potential eco-towns as a result of deteriorating air quality could not be described as unlikely and further investigation was required at the Appropriate Assessment stage.

4.5 Water resources

4.5.1 Much of England has experienced low rainfall for most of the last few years, including dry winters, which has led the Environment Agency to classify large parts of the country as either moderately or highly water stressed (see Figure 6). If the current climate trends continue, it may be impractical in the longer term to preserve wetland habitats characteristic of our former climate but in the short and medium term, it is clear that strenuous efforts to reduce the risk of water stress in European wetland sites should be a priority.

Figure 6: Map of areas of relative water stress⁵⁷



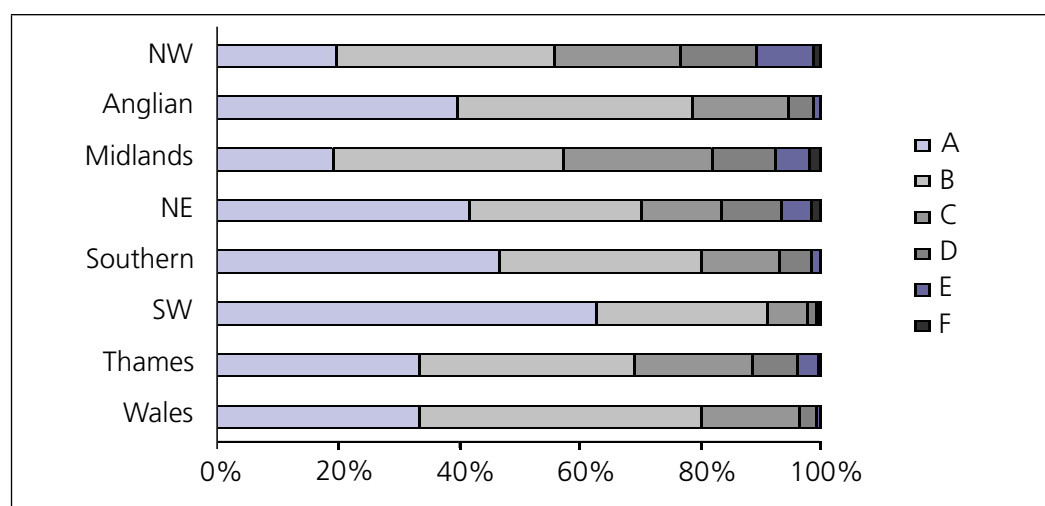
⁵⁷ Environment Agency (undated). *Areas of water stress: final classification* [online] www.environment-agency.gov.uk/commondata/acrobat/finalclassification_1935752.pdf (accessed 15 October 2008).

- 4.5.2 There is a risk that increased abstraction will lower water levels within watercourses that are designated as, or which feed, European sites, thereby reducing freshwater inputs. This could potentially lead to increased salinity of saltmarshes, increased sedimentation of the river channel due to reduced flows and a reduction in the freshwater available to SPA birds for drinking and bathing⁵⁸.
- 4.5.3 Given the complex mechanisms that can be used by the water companies to meet existing and future water supply, it was concluded that adverse effects on European sites from the potential eco-towns as a result of increased abstraction from sensitive surface and groundwater sources could not be described as unlikely and further investigation was required at the Appropriate Assessment stage.

4.6 Water quality

- 4.6.1 Increased amounts of housing or business development can lead to reduced water quality of rivers and estuarine environments. Sewage and industrial effluent discharges can contribute to increased nutrients on European sites leading to unfavourable conditions. In addition, diffuse pollution, partly from urban run-off has been identified during an Environment Agency Review of Consents process, as being a major factor in causing unfavourable condition of European sites.
- 4.6.2 Overall, water quality in England is improving, but there is still a considerable disparity between the different regions – see Figure 7.

Figure 7: Biological water quality of rivers and canals, 2005⁵⁹



⁵⁸ Ravenscroft, N.O.M. and Beardall, C.H. (2003). The importance of freshwater flows over estuarine mudflats for wintering waders and wildfowl. *Biological Conservation* 113(1): 89-97.

⁵⁹ Department for Environment, Food and Rural Affairs (2005). *Biological water quality of rivers and canals: 1990, 1995, 2000 to 2005, England, Wales and Northern Ireland* [online] www.defra.gov.uk/environment/statistics/inlwater/alltables.htm (accessed 13 August 2008). Biological grading is based on the monitoring of invertebrates that live in, or on the bed of, rivers and canals. A and B = good; C and D = fair; E = poor; F = bad

4.6.3 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour
- Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

4.6.4 For sewage treatment works close to capacity, further development may increase the risk of effluent escape into aquatic environments. In many urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk.

4.6.5 Given that long distance hydrological connections can exist between the watercourses into which treated effluent is discharged and downstream European sites (for example, the River Trent is not designated as a European site, but ultimately drains into the Humber Estuary which is designated), it was concluded that adverse effects on European sites from the potential eco-towns as a result of water quality could not be described as unlikely and further investigation was required at the Appropriate Assessment stage.

4.7 Conclusion of likely significant effect test

4.7.1 None of the shortlisted locations and the reasonable alternatives could be screened out and a full Appropriate Assessment was subsequently undertaken. The assessment for each location is set out in the relevant locational chapter.

4.8 Pan-regional topic: Diffuse air quality

4.8.1 Although the Appropriate Assessment for each eco-town location is included within the relevant locational chapter, it was considered that one issue – cumulative impacts on diffuse air quality – did not lend itself to a location-by-location analysis but needed to be considered across the potential eco-towns as a whole. It is therefore considered below.

Diffuse air quality

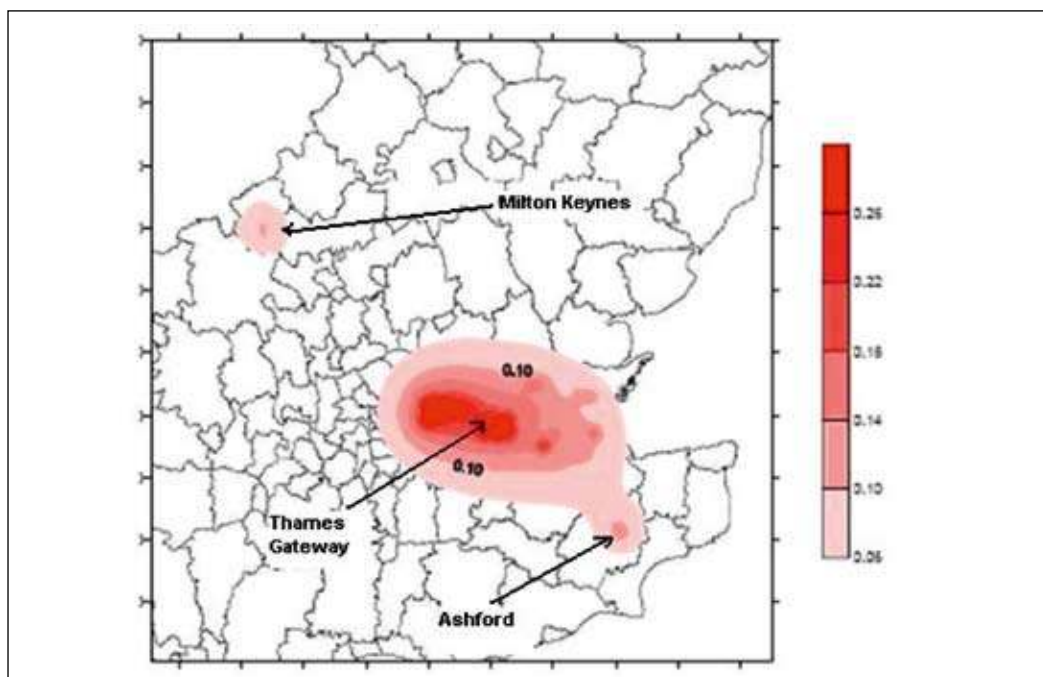
4.8.2 The most acute impacts of NO_x and SO₂ take place close to where they are emitted, but individual sources of pollution will also contribute to an increase in the general background levels of pollutants at a much wider scale, as small amounts of NO_x and other pollutants from the pollution source are dispersed by the prevailing winds.

4.8.3 There is currently no site-specific modelling available for individual eco-town locations, but modelling carried out by the Environment Agency⁶⁰ in relation to hypothetical housing allocations for Ashford (13,200 homes) and Milton Keynes (19,300 homes) during early work in 2006 on the South East England RSS ('The South East Plan') calculated that NO₂ levels within the vicinity of these developments would increase by approximately 0.1 – 0.14 µgm⁻³, rapidly dropping to less than 0.1 µgm⁻³ as one moves away from the development, such that the contributions of NO₂ beyond the actual borough/district within which development is located will often be negligible (0.06 µgm⁻³ or less) even for relatively large developments, when considered in isolation.

4.8.4 This modelling concluded that additional emissions arising therefore represented only a small change to existing pollution levels. This was concluded to be because the additional housing, although numerically significant, represented only a small change to the total national housing stock. Similar-sized developments elsewhere in the country (ie the eco-towns) can be assumed to lead to increases of a similar scale and pattern.

⁶⁰ Fisher, B.E.A. & Stewart G.W. (2006). *Impacts of Proposed Housing Growth in South East England: Air Quality Summary Report*. Bristol: Environment Agency.

Figure 8: Incremental annual concentration of NO₂ (µg/m³) arising from new housing in the South East (after Fisher and Stuart 2006)



- 4.8.5 While this increase in NO₂ concentrations is small, insufficient data exist to determine what the cumulative impact of these small-scale changes in NO₂ will be on European sites when considered alongside all other development planned within England (ie a national target of 240,000 new homes per year by 2016 and the delivery of 2 million homes by 2016 and 3 million by 2020 plus other development including employment-related development and infrastructure). Since many European sites are already subject to poor air quality, even a small amount of additional air pollution may prove significant in its cumulative effects even if each discrete development is only responsible for a minor increase in atmospheric pollution.

Local air quality

- 4.8.6 Air quality effects on European sites within close proximity (taken for the purposes of this assessment as being within 2km) to either the eco-town or the local road network surrounding the eco-town are considered in the individual location chapter. However, during their existence it is inevitable that at times (such as when making recreational visits to European sites) the population of the eco-towns will drive along roads that lie within 200m of European sites that are not in close proximity to the eco-town. In turn this will contribute to a cumulative increase in nitrogen deposition and an associated deterioration in ecological quality of parts of the European sites. While it is clearly impossible to quantify this issue at all it is reasonable to conclude that the situation will be most acute where major roads traverse European sites. Examples of these instances are given in Table 12 below. Note that this list is not exhaustive.

Table 12: European sites that lie within 200m of major roads

Region	European site	Major roads within 200m
South East England	Ashdown Forest SAC/SPA	A22
	Lydden & Temple Ewell Downs SAC	A2
	The New Forest SAC/SPA	M27/A31; A35; A337; A326
	Woolmer Forest SAC/Wealden Heaths Phase 2 SPA	A3 and A325
	Thursley, Ash, Pirbright and Chobham Common SAC	M3 and A3
	Thames Basin Heaths SPA	A30, A322 and M3
East of England	River Wensum SAC	A1067
	The Broads SAC/Broadland SPA	A149; A1064
	Breydon Water SPA	A47
	Epping Forest SAC	M25; A104; A121
	Ouse Washes SAC/SPA	A412
	Portholme SAC	A14
East Midlands	Rutland Water SPA	A608; A6003
	Peak District Moors SPA/South Pennine Moors SAC	A625; A621; A619
South West	Dorset Heaths	A31; A35
	Breney Common and Goss & Tregoss Moors SAC	A30
	Marazion Marsh SPA	A394
	St Austell Clay Pits SAC	A391
Yorkshire & Humber	Lower Derwent Valley SAC	A1079
	River Derwent SAC	A166
	North York Moors SAC/SPA	A171
	South Pennine Moors SAC/South Pennine Moors Phase 2 SPA	A6033

- 4.8.7 In the absence of any further data or any ability to relate these incremental changes in air quality to particular European sites, or quantify the resulting effect, it is necessary to assume that cumulatively, the levels of NO_x produced by the 90,000 homes (and particularly the associated vehicles) delivered under the Eco-towns Programme, while they may not be sufficiently great to reverse predicted national air quality improvements being made by cleaner vehicle engines and the Euro-Standards, may nonetheless contribute to a slow-down in such improvements. Measures are therefore required to ensure that the contribution of the eco-towns is minimised.
- 4.8.8 Mitigation at the strategic level is difficult because of a lack of precedents and consequently maintaining data. In our view it would not be reasonable to conclude that potential impacts are such that no development could ever be accommodated. However, we propose that the PPS should:

- incorporate an extensive suite of measures to encourage the use of sustainable transport, maximise the provision of such transport and discourage car use as far as possible;
- require planning applications to undertake transport assessments through which it can be demonstrated that all opportunities are being taken for minimising car use; and
- couple these measures with monitoring of the air quality in the European site before and for a number of years after introduction of the measures, such that further measures can be devised if the air quality does not improve.

4.8.9 The transport policy in the eco-towns PPS does include a number of robust measures to encourage use of non-road transport and these will contribute considerably to avoiding a local increase in NO_x emissions from traffic (and thereby an increase in nitrogen deposition). This policy states that:

“Planning applications should include travel plans which demonstrate:

- *how the town’s design will enable at least 50 per cent of trips originating in the eco-town to be made by non-car means*
- *good design principles, drawing from the Manual for Streets, CABE’s building for Life Code, and community travel planning principles*
- *how transport choice messages and infrastructure will be provided from ‘day one’ of residential occupation; and*
- *how the carbon impact of transport in the eco-town will be monitored as part of embedding a long-term low-carbon approach to travel within plans for community governance.”*

4.8.10 We believe that these measures would meet the first two of the criteria we have listed above, but that the PPS should also incorporate a direction that:

- all homes should be within an easy walk of core services (such as schools, local shops, health services and sports facilities) and of a frequent and high quality public transport service linking business and residential areas and the wider transport network; and
- all air quality improvement measures should be coupled with monitoring of the air quality in the European site before and for a number of years after introduction of the measures, such that further measures can be devised if the air quality does not improve.

4.8.11 With these measures in place it is considered that the PPS will have gone as far as it can in ensuring that the diffuse air quality effects on European sites from the eco-towns when considered collectively are minimised.

Appendix 1: Taking account of the scoping consultation responses

The table below provides a brief summary of responses received during Stage A in the Sustainability Appraisal (SA) process and how these were taken into account in the subsequent SA of the Draft Eco-towns Planning Policy Statement and the Eco-towns Programme (ie the shortlisted eco-towns locations and reasonable alternatives).

Eco-Towns Stage A Consultation Responses		
Consultation question	Summary of consultees' views	How was this taken into account in the SA?
1. What changes, if any, would you like to see in the Eco-towns Sustainability Appraisal Objectives? (relates to section 4 of this Scoping Report)	<p>Environment Agency</p> <p>Prioritise focus on key sustainability issues. Duplicate criteria should be removed from the SA Framework.</p> <p>Amend Objectives to take account of:</p> <ul style="list-style-type: none"> • surface water drainage • waste treatment and disposal capacity • cross-referenced water related effects to provide an evaluation of the effect on the water environment as a whole • sustainability standards in eco-towns higher than other new developments • interaction effects between the Eco-towns Policy Statement and regional and local spatial planning policies • water resources • climate change adaptation (particularly in the South East and East of England) • environmental quality and pollution • effect on existing development and on surface water drainage issues • capacity of waste infrastructure to integrate with proposed eco-town locations 	<p>The SA issues considered in the appraisal of the Draft PPS were narrowed down to two key issues: housing and greener housing. The appraisal of the Eco-towns Programme focused on a series of key issues as set out in the final version of the Scoping Report.</p> <p>The SA of the Draft PPS considers water and flood risk issues as part of the broader greener housing issue at a level of detail considered proportionate to the PPS.</p> <p>The SA of the Eco-towns Programme includes an appraisal of impacts under the headings climate change adaptation and flood risk; waste; and water resources and water quality.</p> <p>The sustainability standards for eco-towns are considered in the SA of the Draft PPS.</p> <p>The appraisal of each shortlisted location (and reasonable alternatives) includes a section on the regional and local policy context.</p>

Eco-Towns Stage A Consultation Responses		
Consultation question	Summary of consultees' views	How was this taken into account in the SA?
1. What changes, if any, would you like to see in the Eco-towns Sustainability Appraisal Objectives? (relates to section 4 of this Scoping Report) <i>(continued)</i>	<p>English Heritage</p> <p>Include references to the retention of landscape character and local distinctiveness</p>	The SA of the Eco-towns Programme includes an appraisal of impacts under the heading Landscape and historic environment.
	<p>Natural England</p> <p>Include landscape as an environmental factor</p>	The SA of the Eco-towns Programme includes an appraisal of impacts under the heading Landscape and historic environment.
2. What gaps in the Baseline information do you feel could limit the ongoing Sustainability Appraisal (assessments, reporting and monitoring)? (sections 5 and 6 of this Report)	<p>Environment Agency (also covers question 3)</p> <p>The following should be considered:</p> <ul style="list-style-type: none"> • Water resources (especially South East and East) • Review of Cross-Govt assessment to ensure all of the important issues are included. • Land contamination issues and issues related to surface water run-off. • The Summary of Significant Water Management Issues documents produced in relation to the WFD river basin planning process. • Review of Planning Policy Statement 25 (Development and Flood Risk) and the Pitt Review report (Learning lessons from the 2007 floods). • Recreation strategies (including the Environment Agency's 'A better place to play') particularly access to water based recreation. • Pollution Prevention Guidance (PPG) notes • Greenhouse gas emissions (GHG) associated with the eco-towns concept. • Air quality • How climate change will influence the predicted future trends in the sustainability baseline. 	<p>The SA of the Eco-towns Programme includes an appraisal of impacts under the headings climate change adaptation and flood risk; climate change mitigation; and water resources and water quality. Air quality and land contamination issues are referred to where relevant.</p> <p>The SA of the Draft PPS and the Eco-towns Programme includes information on the cross-Governmental assessment of the submitted proposals.</p> <p>The SA of the Eco-towns Programme includes a section for each location entitled 'What will be the situation without the Eco-town? (the business-as-usual option)'.</p> <p>The Scoping Report appendices include a review of relevant plans, programmes and objectives (this includes PPS25 for example).</p>

Eco-Towns Stage A Consultation Responses		
Consultation question	Summary of consultees' views	How was this taken into account in the SA?
2. What gaps in the Baseline information do you feel could limit the ongoing Sustainability Appraisal (assessments, reporting and monitoring)? (sections 5 and 6 of this Report) (<i>continued</i>)	<p>English Heritage</p> <ul style="list-style-type: none"> • Maps showing designated heritage assets • Historic landscape characterisation • Historic Environment Records where missing • European Landscape Convention • Planning (Listed Buildings and Conservation Areas) Act 1990 	<p>The SA of the Eco-towns Programme includes an appraisal of impacts under the heading landscape and historic environment. The appraisal also includes baseline evidence regarding landscape and historic character where this is available.</p> <p>The Scoping Report appendices include a review of relevant plans, programmes and objectives.</p>
3. Which sources of information or sets of data do you feel could be added to the Baseline to improve its usefulness, given the intended use in the SA process? (sections 5 and 6)	<p>Environment Agency (see 2 above)</p> <p>English Heritage (see 2), also:</p> <ol style="list-style-type: none"> 1. All designated historic assets should be considered together with potential impacts on non-designated features of local historic or architectural interest and value since these can make an important contribution to creating a sense of place and local identity. 2. <ul style="list-style-type: none"> • Heritage Counts • National Monuments Record Centre, Swindon • Heritage Gateway • Magic website • Listed Buildings online • English Heritage annual Buildings at Risk register • (Grade I and II* listed buildings only) and structural • Scheduled Monuments) • Countryside Quality Counts • HELM • Archaeological Data Service (ADS) • Aerial photographs: National Mapping Programme; Aerial Photographs: National and Regional skills report • Quality of Life Assessment 	<p>The SA of the Eco-towns Programme includes an appraisal of impacts under the heading landscape and historic environment. The appraisal also includes baseline evidence regarding landscape and historic character where this is available.</p> <p>The Scoping Report appendices include a review of relevant plans, programmes and objectives.</p>

Eco-Towns Stage A Consultation Responses		
Consultation question	Summary of consultees' views	How was this taken into account in the SA?
3. Which sources of information or sets of data do you feel could be added to the Baseline to improve its usefulness, given the intended use in the SA process? (sections 5 and 6) (continued)	<p>Natural England</p> <p>1. Information held in NE regional offices on the range of management plans, strategies etc that relate to each eco-town location</p>	The SA of the Eco-towns Programme includes an appraisal of impacts under the heading biodiversity and green infrastructure. Local Biodiversity Action Plans and other relevant initiatives are referred to as appropriate.
4. What changes, if any, would you like to see to the Eco-towns Sustainability Appraisal Framework and proposals for its use to assess options? (section 7)	<p>Environment Agency</p> <p>1. The SA Framework should be rationalised to remove duplicate criteria that cover similar environmental issues</p> <p>2. Prioritise the SA approach in general, but not the appraisal of different eco-town locations as this could result in inconsistent SAs</p> <p>3. Include changes to the SA framework:</p> <ul style="list-style-type: none"> • Climate Change Mitigation – include GHG emissions from waste treatment related to eco-towns • Climate Change Adaptation – consider future cooling needs of eco-town communities • Flood Risk – criteria related to surface water drainage • Environmental Quality & Pollution – add criterion in air quality • Cross-reference each eco-town's effect on these criteria to provide an overall appraisal of the effect of all eco-towns on the water environment as a whole. • Hydro-morphology 	<p>The SA issues considered in the appraisal of the Draft PPS were narrowed down to two key issues: housing and greener housing. The appraisal of the Eco-towns Programme focused on a consistent set of key issues as set out in the final version of the Scoping Report.</p> <p>The SA of the Eco-towns Programme includes an appraisal of impacts under the headings climate change adaptation and flood risk; climate change mitigation; and water resources and water quality. Air quality is referred to where relevant.</p> <p>The SA of the Eco-towns Programme includes an appraisal of cumulative impacts.</p>
	<p>English Heritage</p> <p>Landscape and heritage asset criteria should not be excluded from any tailored framework.</p>	The SA of the Eco-towns Programme includes an appraisal of impacts under the heading landscape and historic environment.

Eco-Towns Stage A Consultation Responses		
Consultation question	Summary of consultees' views	How was this taken into account in the SA?
5. What changes, if any, would you like to see to the ongoing SA process and/or to the scope, structure and level of detail of the SA Report?	<p>Environment Agency</p> <ol style="list-style-type: none"> 1. Consider the possibility of urban extensions/densification utilising the eco-standards being developed 2. Appraise the proposed eco-towns criteria that will be presented in the draft Policy Statement, against the SA framework 3. How the eco-towns criteria, set out in the draft Policy Statement, compare with sustainability policies being developed at the regional and local authority level 4. Cumulative effects at the regional scale 5. Include indicators in the SA Report to be used for SA monitoring 6. Identify, describe and evaluate positive as well as negative effects 	<p>The SA of the Draft PPS sets out the rationale for alternatives considered.</p> <p>The SA of the Draft PPS provides commentary on the proposed eco-towns standards.</p> <p>The Draft PPS itself discusses the stringency of the eco-towns standards in relation to current practice.</p> <p>The SA of the Eco-towns Programme includes an appraisal of cumulative impacts.</p> <p>The SA of the Draft PPS discusses potential monitoring arrangements.</p> <p>The SA of the Eco-towns Programme discusses the positive and negative aspects of the various locations.</p>
	<p>English Heritage</p> <ol style="list-style-type: none"> 1. Assess the 'no eco-town' alternative is properly appraised as part of the examination of potential alternatives 2. Assess the option of urban extensions 	<p>The SA of the Draft PPS sets out the rationale for alternatives considered. The SA includes an appraisal of the business-as-usual option (ie not developing eco-towns).</p>
	<p>Natural England</p> <ol style="list-style-type: none"> 1. Alternatives assessed should include different sizes of eco-towns, urban extensions and increased housing densities 	<p>The SA of the Draft PPS sets out the rationale for alternatives considered.</p>

Glossary

Abbreviation

AA	Appropriate Assessment
AD	Anaerobic Digestion
AMR	Annual Monitoring Report
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
AWCS	Automated Waste Collection Systems
CAMS	Catchment Abstraction Management Strategies
CHP	Combined Heat and Power
CNP	Campaign for National Parks
CPRE	Campaign to Protect Rural England
CRP	Community Reference Point
DEFRA	Department for the Environment, Food and Rural Affairs
DPA	Dwellings Per Annum
DPD	Development Plan Document
EIA	Environmental Impact Assessment
EiP	Examination in Public
EP	English Partnerships
FEH	Flood Estimation Handbook
GWMU	Chalk Groundwater Management Unit
HRA	Habitats Regulations Assessment
IMD	Index of Multiple Deprivation
ISSET	Institute of Sustainable Energy Technology
LCAs	Landscape Character Areas
LDF	Local Development Framework
LNR	Local Nature Reserve
LoWS	Local Wildlife Site
LPA	Local Planning Authority

MBC	Metropolitan Borough Council
MRF	Material Recycling Facility
MUSCO	Multi-Utility Supply Company
NNR	National Nature Reserve
ONS	Office of National Statistics
PDL	Previously Developed Land
PUA	Principal Urban Area
RDF	Refuse Derived Fuel
RPB	Regional Planning Body
RTR	Rapid Transit Route
SA	Sustainability Appraisal
SAC	Special Areas of Conservation
SAPs	Species Action Plans
SEA	Strategic Environmental Assessment
SEEDA	The South East England Development Agency
SFRA	Strategic Flood Risk Assessment
SINCs	Sites of Importance for Nature Conservation
SLA	Special Landscape Area
SNCI	Sites of Nature Conservation Importance
SOAs	Super Output Areas
SPA	Special Protection Areas
SRS	Sub-Regional Strategy
SSSI	Site of Special Scientific Interest
STW	Sewerage Treatment Works
SUDS	Sustainable Drainage Systems
SUE	Sustainable Urban Extension
UKCIP	UK Climate Impacts Programme
WRAP	Waste & Resources Action Programme
WRMU	Water Resource Management Units
WRZ	Water Resource Zone