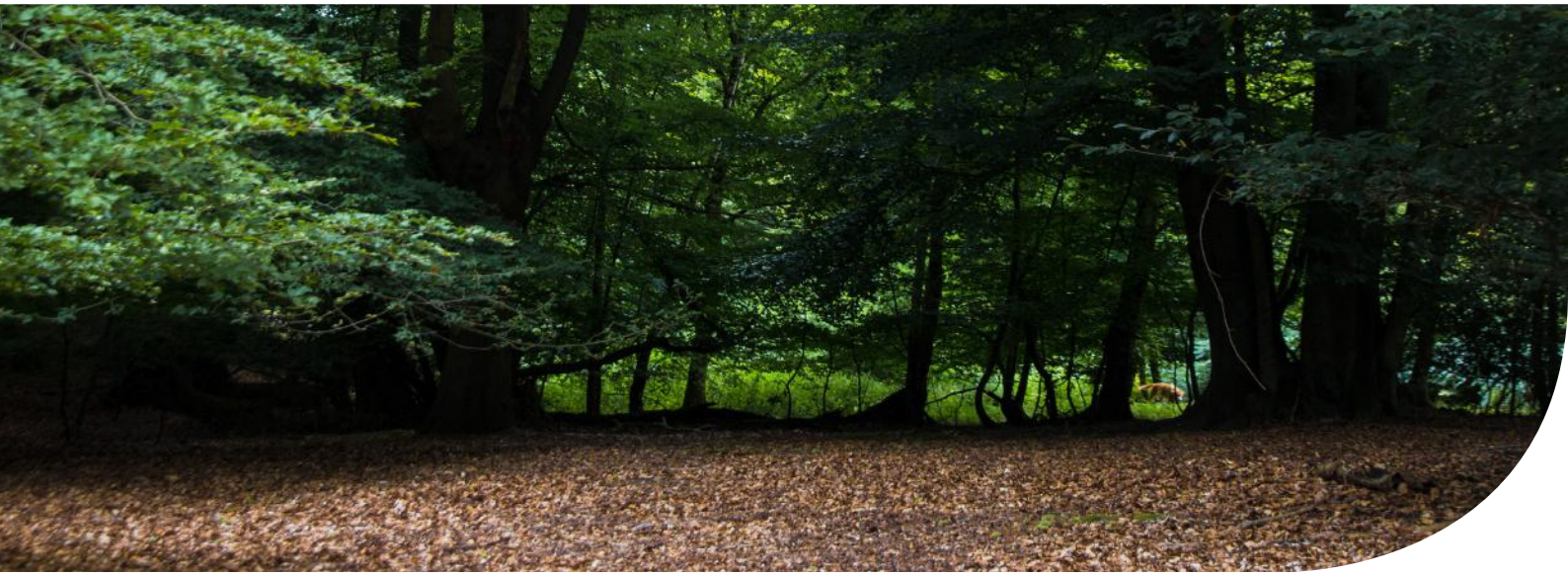
Habitats Regulations Assessment of the Broxbourne Emerging Local Plan

HRA Screening Report

December 2016



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Habitats Regulations Assessment of the Borough of Broxbourne Draft Local Plan

Screening Report

LC-218	Document Control Box
Client	Broxbourne Borough Council
Report Title	Habitats Regulations Assessment of the Borough of Broxbourne Draft Local Plan
Status	Draft
Filename	LC-218_Broxbourne_HRA_Screening_7_221116JE.docx
Date	December 2016
Author	JE
Reviewed	RB
Approved	ND

Photo: Epping Forest by Cat

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Acronyms

AA	Appropriate Assessment
AQMA	Air Quality Management Area
DEFRA	Department for Environment, Food, and Rural Affairs
EU	European Union
GIS	Geographic Information Systems
HRA	Habitats Regulations Assessment
IPENS	Improvement Programme for England's Natura 2000 sites
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
LPA	Local Planning Authority
LSE	Likely Significant Effect
LVRP	Lee Valley Regional Park
LVRPA	Lee Valley Regional Park Authority
NE	Natural England
NPPF	National Planning Policy Framework
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SANG	Suitable Alternative Natural Greenspace
SIP	Site Improvement Plan
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

Executive Summary

E1 This HRA report has carefully considered the conservation objectives of European sites that might be associated with activities and projects as part of the Borough of Broxbourne draft Local Plan 2016 - 2031 (Local Plan).

E2 Lepus identified four European sites that lie within 15km of the boundary of the borough of Broxbourne.

E3 The following four sites feature in this HRA report:

- Epping Forest SAC;
- Lee Valley SPA;
- Lee Valley Ramsar; and
- Wormley Hoddesdonpark Woods SAC.

E4 A number of recognised threats and pressures are associated with these sites as identified by Natural England. This HRA screening report explores the extent to which, if any, the proposals associated with the Local Plan will exacerbate or alleviate these threats and pressures.

E5 It is considered likely that public access associated disturbances caused by the combined developments proposed in the Local Plan will have a significant effect on the conservation objectives of Lee Valley SPA & Ramsar.

1 Introduction

1.1 Background

1.1.1 Lepus Consulting has prepared this Habitats Regulations Assessment (HRA) report of the Borough of Broxbourne draft Local Plan 2016 – 2031 on behalf of the Borough of Broxbourne. This is a requirement of Regulation 102 of the Conservation of Habitats and Species Regulations 2010[1] (the Habitats Regulations).

1.1.2 The following European sites were identified using a 15km area of search around the Borough of Broxbourne, as well as including sites which are potentially connected (e.g. hydrologically) beyond this distance:

- Epping Forest SAC;
- Lee Valley SPA;
- Lee Valley Ramsar; and
- Wormley Hoddesdonpark Woods SAC.

1.1.3 Whilst Ramsar sites are not European sites, NPPF paragraph 118 states that Ramsar sites should be given the same protection as European sites. For the purpose of this report, the phrase 'European site' includes Ramsar sites, along with Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) unless otherwise stated.

1.1.4 The full list of the nature of, and conservation objectives of, each site can be found in **Table A.1** and they are explored further in this report. Qualifying features of the sites include species such as the great bittern and the gadwall and habitats such as beech forests on acid soils and oak hornbeam forests.

1.1.5 The full list of threats and pressures each site is currently facing can be found in **Table B.1.** In **Section 4.4** some threats and pressures are scoped out of the assessment. The remaining threats and pressures, which represent a focus of this assessment, include 'Water pollution, 'Hydrological changes', 'Public access/disturbance', 'Invasive species', 'Air pollution' and 'Vehicles: illicit'. These can be seen in **Table 4.3.**

[1] UK Government, (2010), The Conservation of Habitats and Species Regulations 2010

1.2 Approach to report preparation

1.2.1 The outputs of this report include information in relation to:

- The HRA process;
- Methodology for HRA;
- Evidence gathering in relation to European sites;
- Conservation objectives of sites;
- Understanding threats and pressures relevant to each site; and
- Conclusions and recommendations.

1.2.2 This report comprises a screening and scoping assessment under the Habitats Regulations, which is the first step in assessing any likely significant effects of development proposals in the Local Plan. This report sets the baseline with regards to European sites and determines whether the Local Plan is likely to have any significant effects on these sites.

1.3 The HRA process

1.3.1 The application of HRA to land-use plans is a requirement of the Conservation of Habitats and Species Regulations 2010, the UK's transposition of European Directive 92/43/EEC *on the conservation of natural habitats and of wild fauna and flora* (the Habitats Directive). HRA applies to plans and projects, including all Local Development Documents in England and Wales.

1.3.2 The HRA process assesses the potential effects of a plan or project against the conservation objectives of any European sites designated for their importance to nature conservation. These sites form a system of internationally important sites throughout Europe and are known collectively as the 'Natura 2000 network'.

1.3.3 European sites provide valuable ecological infrastructure for the protection of rare, endangered or vulnerable natural habitats and species of exceptional importance within the EU. These sites consist of SACs, designated under the Habitats Directive, and SPAs, designated under European Directive 2009/147/EC *on the conservation of wild birds* (the Birds Directive). Additionally, Government policy requires that sites designated under the Ramsar Convention (The Convention on Wetlands of International Importance, especially as Waterfowl Habitat) are to be treated as if they are fully designated European sites for the purpose of considering development proposals that may affect them.

1.3.4 Under Regulation 102 of the Habitats Regulations, the assessment must determine whether or not a plan will adversely affect the integrity of the European sites concerned. The process is characterised by the precautionary principle. The European Commission describes the precautionary principle as follows:

1.3.5 "*If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or plant health, which would be inconsistent with protection normally afforded to these within the European Community, the* ***Precautionary Principle*** *is triggered.*"

1.3.6 Decision-makers then have to determine what action/s to take. They should take account of the potential consequences of no action, the uncertainties inherent in scientific evaluation, and should consult interested parties on the possible ways of managing the risk. Measures should be proportionate to the level of risk, and to the desired level of protection. They should be provisional in nature pending the availability of more reliable scientific data.

1.3.7 Action is then undertaken to obtain further information, enabling a more objective assessment of the risk. The measures taken to manage the risk should be maintained so long as scientific information remains inconclusive and the risk is unacceptable.

1.3.8 The hierarchy of intervention is important: where significant effects are likely or uncertain, plan makers must firstly seek to avoid the effect through, for example, a change of policy. If this is not possible, mitigation measures should be explored to remove or reduce the significant effect. If neither avoidance, nor subsequently, mitigation is possible, alternatives to the plan should be considered. Such alternatives should explore ways of achieving the plan's objectives that do not adversely affect European sites.

1.3.9 If no suitable alternatives exist, plan-makers must demonstrate under the conditions of Regulation 103 of the Habitats Regulations, that there are Imperative Reasons of Overriding Public Interest (IROPI) in order to continue with the proposal.

1.4 About the draft Local Plan

1.4.1 The draft Local Plan is a development strategy for the homes, jobs, shops, leisure, transport and infrastructure of Broxbourne for the next 15 years. This version of the draft Local Plan was prepared under Regulation 18 of the Town and Country Planning (Local Planning) (England) Regulations 2012. It includes proposals for the provision of just over 7,000 homes and 6,000 – 7,000 jobs by 2031. These policies will replace those of the Local Plan 2005.

1.4.2 Each proposal for development in the draft Local Plan has been considered in the preparation of this HRA and were either screened in or out of this assessment. A summary of these findings can be found in **Table 4.2.**

1.5 HRA process to date

1.5.1 The HRA process is iterative and assesses different stages of the plan making process. The HRA process of this report draws on the updated methodology prepared by David Tyldesley Associates for the Habitat Assessment Handbook[2], as explained in **Section 2.1**.

1.5.2 Broxbourne Borough Council has determined the need for a HRA and has commissioned Lepus Consulting to undertake the scoping and screening stages for the draft Local Plan. This report constitutes a screening report, which includes the screening stages of **Figure 2.1**.

[2] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook – Chapter F. DTA Publications

2 Methodology

2.1 Habitats Regulations Assessment methodology

2.1.1 HRA is a rigorous precautionary process centered on the conservation objectives of a site's qualifying interests. It is intended to ensure that designated European sites are protected from impacts that could adversely affect their integrity, as required by the Birds and Habitats Directives.

2.1.2 There is no set methodology or specification for carrying out and recording the outcomes of the assessment process. Government guidance on the HRA process was published by Defra in 2013 as a consultation draft. In the absence of a finalised or alternative version since then, the 2013 consultation draft represents the government's most recent thinking.

2.1.3 The 2013 consultation draft helped inform the Habitats Regulations Assessment Handbook, produced by David Tyldesley Associates. The handbook, in particular 'Practical Guidance for the Assessment of Plans under the Regulations (September, 2013)', which forms part F, was used to prepare this report. This is widely considered to be an appropriate basis for the HRA of plans, as the Handbook is also used by Natural England, the Government's statutory nature conservation organisation.

2.1.4 Screening of a plan for the likelihood of significant effects should be undertaken as soon as is practical. Most plans cannot be excluded, exempted or eliminated from assessment. If not, it is important to gather information on the European sites that may be affected by the plan. Each European site has conservation objectives, the integrity of which are currently under various pressures and facing various threats.

2.1.5 If a significant effect on a site because of a plan is considered likely, mitigation efforts may be incorporated in to the plan before it is rescreened in an iterative process. If a significant effect remains likely, an Appropriate Assessment on the plan may be required. This provides a better understanding of potential effects and therefore assists in the identification of suitable mitigation measures. Mitigation measures are then applied until no adverse effect on the site's integrity is predicted. Natural England, or the relevant statutory body, is also consulted over the findings of the draft HRA. A step-by-step guide to this methodology is outlined in the Practical Guidance and has been reproduced in **Figure 2.1.**

2.2 Dealing with uncertainty

2.2.1 The assessment of effects can be affected by uncertainty in a number of ways; some of these are addressed below.

Regulatory Uncertainty

2.2.2 Some plans will include references to proposals that are planned and implemented through other planning and regulatory regimes, for example, trunk road or motorway improvements. These will be included because they have important implications for spatial planning, but they are not proposals of the Local Planning Authority (LPA), nor are they proposals brought forward by the plan itself. Their potential effects will be assessed through other procedures. The LPA may not be able to assess the effects of these proposals. Indeed, it may be inappropriate for them to do so, and would also result in unnecessary duplication.

2.2.3 There is a need to focus the Habitats Regulations Assessment on the proposals directly promoted by the plan, and not on all and every proposal for development and change, especially where these are planned and regulated through other statutory procedures, which will be subject to HRA.

Planning Hierarchy Uncertainty

2.2.4 The higher the level of a plan in the hierarchy the more general and strategic its provisions will be and therefore the more uncertain its effects will be. The protective regime of the Directive is intended to operate at differing levels. In some circumstances assessment 'down the line' will be more effective in assessing the potential effects of a proposal on a particular site and protecting its integrity. However, three tests should be applied (see A, B and C below).

2.2.5 It will be appropriate to consider relying on the HRA of lower tier plans, in order for an LPA to ascertain a higher tier plan would not have an adverse effect on the integrity of a European site, only where:

A] The higher tier plan assessment cannot reasonably assess the effects on a European site in a meaningful way; whereas

B] The HRA of the lower tier plan, which will identify more precisely the nature, scale or location of development, and thus its potential effects, is able to change the proposal if an adverse effect on site integrity cannot be ruled out. This is because the lower tier plan is free to change the nature and/or scale and/or location of the proposal in order to avoid adverse effects on the integrity of any European site (e.g. it is not constrained by location specific policies in a higher tier plan); and

C] The HRA of the plan or project at the lower tier is required as a matter of law or Government policy.

2.2.6 It may be helpful for the HRA of the higher tier plan to indicate what further assessment may be necessary in the lower tier plan.

Implementation Uncertainty

2.2.7 In order to clarify the approach where there is uncertainty because effects depend on how the plan is implemented, and to ensure compliance with the Regulations, it may be appropriate to impose a caveat in relevant policies, or introduce a free-standing policy, which says that any development project that could have an adverse effect on the integrity of a European site will not be in accordance with the plan.

2.2.8 This would help to enable the assessors to reasonably conclude, on the basis of objective information, that even where there are different ways of implementing a plan, and even applying the precautionary principle, no element of the plan can argue that it draws support from the plan, if it could adversely affect the integrity of a European site.

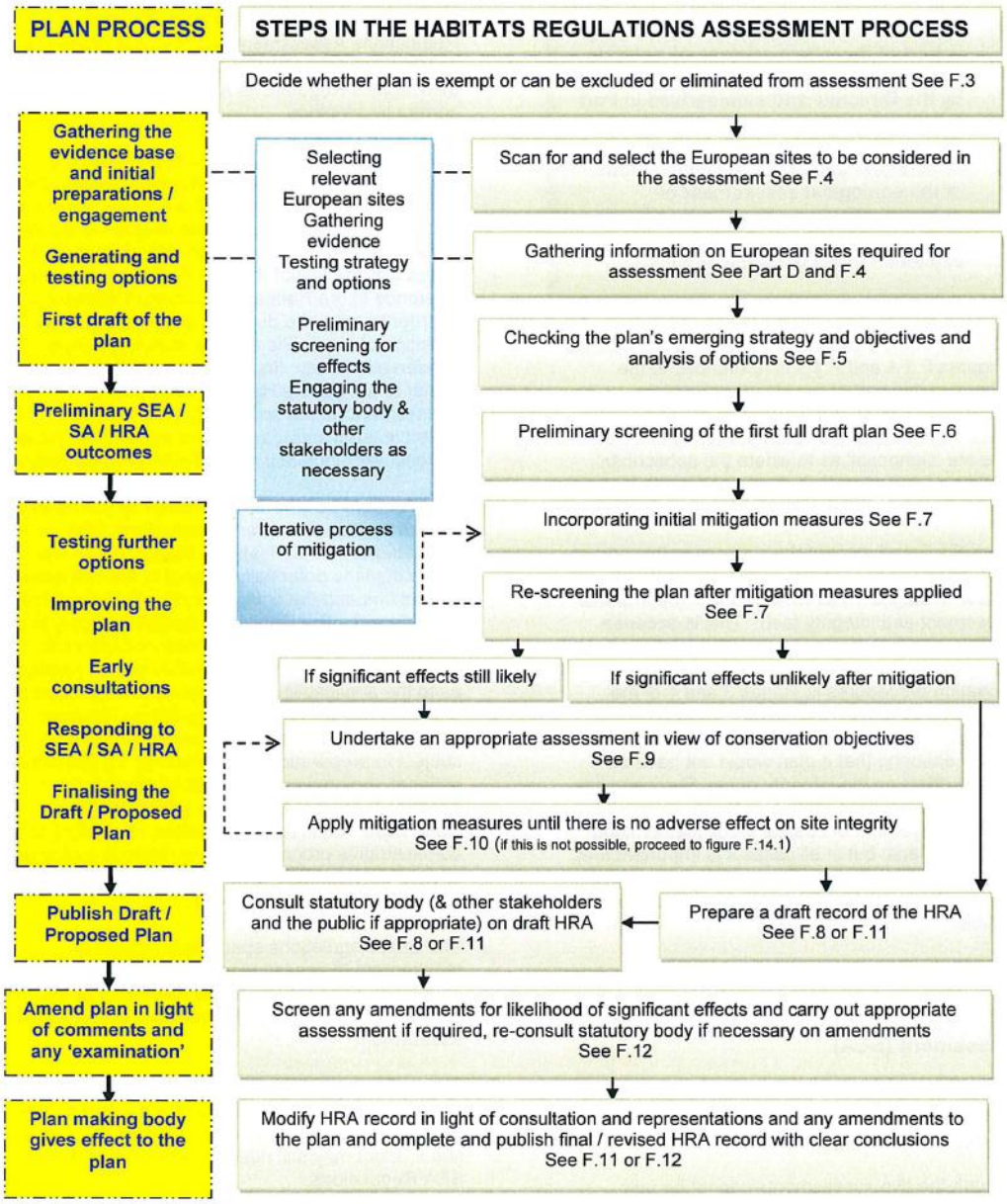
2.3 Likely significant effect

2.3.1 The plan and its component policies are assessed to determine and identify any potential for **'likely significant effect'** (LSE) upon European sites. The guidance provides the following interpretation.

2.3.2 "*In this context, 'likely' means risk or possibility of effects occurring that cannot be ruled out on the basis of objective information. 'Significant' effects are those that would undermine the conservation objectives for the qualifying features potentially affected, either alone or in combination with other plans or projects… even a possibility of a significant effect occurring is sufficient to trigger an 'appropriate assessment'.*"[3]

[3]Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook – Chapter F. DTA Publications

Figure 2.1: Relationship of steps in the Habitats Regulations Assessment with a typical plan-making process, reproduced from the guidance[4].



2.4 Limitations

2.4.1 This report has been prepared using the best available data. References are cited in the text where appropriate. Lepus Consulting has collected no primary data in the preparation of this report.

2.4.2 In order to prepare this HRA, Lepus has been supplied with the draft Local Plan. The full plan is still undergoing preparation.

[4] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook – Chapter F. DTA Publications

3 European sites

3.1 About European sites

3.1.1 Each site of European importance has its own intrinsic qualities, besides the habitats or species for which it has been designated, that enables the site to support the ecosystems that it does. An important aspect of this is that the ecological integrity of each site can be vulnerable to change from natural and human induced activities in the surrounding environment (pressures and threats). For example, sites can be affected by land use plans in a number of different ways, including the direct land take of new development, the type of use the land will be put to (for example, an extractive or noise-emitting use), the pollution a development generates and the resources used (during construction and operation for instance).

3.1.2 An intrinsic quality of any European site is its functionality at the landscape ecology scale. This refers to how the site interacts with the zone of influence of its immediate surroundings, as well as the wider area. This is particularly the case where there is potential for developments resulting from the plan to generate water or air-borne pollutants, use water resources or otherwise affect water levels. Adverse effects may also occur via impacts to mobile species occurring outside of a designated site but which are qualifying features of the site. For example, there may be effects on protected birds that use land outside the designated site for foraging, feeding, roosting or other activities.

3.2 Identification of relevant European sites

3.2.1 The guidance[5] specifies no specific size of search area for European sites. During the screening process, as a starting point to explore and identify which sites might be affected by the Local Plan, a 15km area of search was applied from the boundary of the Borough of Broxbourne. Direct effects of a plan on a site usually require closer proximity than 15km. A total of four European sites were identified.

[5] [5] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook – Chapter F. DTA Publications

3.3 Ecological information

3.3.1 **Table A.1** identifies the qualifying features of each site and presents details of conservation objectives for each of the sites identified as potentially being affected by the Local Plan. This information is drawn from the Joint Nature Conservancy Council (JNCC) and Natural England (NE).

4 Potential Effects

4.1 Introduction

4.1.1 The four European sites identified for assessment during baseline research are illustrated in **Figure 4.1** and listed in **Table 4.1**. Each site is within 15km of the border of the borough of Broxbourne.

4.1.2 Sites of Special Scientific Interest (SSSI) are protected areas in the United Kingdom designated for conservation. SSSI units located either entirely or partially within the European sites considered in this report are listed in **Table 4.1** along with their current conservation status. The conservation status of each SSSI unit will be one of the following:

- Favourable;
- Unfavourable – recovering;
- Unfavourable – no change; or
- Unfavourable – declining.

4.1.3 SSSI units in an either 'Unfavourable – no change' or 'Unfavourable – declining' condition indicate the European site may be particularly vulnerable to certain threats or pressures. For example, it was found that eight SSSI units intersecting with Epping Forest SAC are in an 'Unfavourable – no change' condition. For each of these SSSI units, air quality was identified as the primary cause for its condition being unfavourable. As such, developments in the area would need to take full account of the potential to adversely affect the air quality at the Epping Forest SAC and adopt mitigation measures as appropriate.

Table 4.1: European sites within 15km of the Borough of Broxbourne border and the conservation statuses of corresponding SSSI units.

European Site	Quantity of SSSI units	Conservation status
Epping Forest SAC	38	11/38 Favourable 18/38 Unfavourable - recovering 8/38 Unfavourable - no change 1/38 Unfavourable - declining
Lee Valley SPA & Ramsar	24	12/24 Favourable 12/24 Unfavourable - recovering
Wormley Hoddesdonpark Woods SAC	25	21/25 Favourable 2/25 Unfavourable - recovering 2/25 Unfavourable - no change

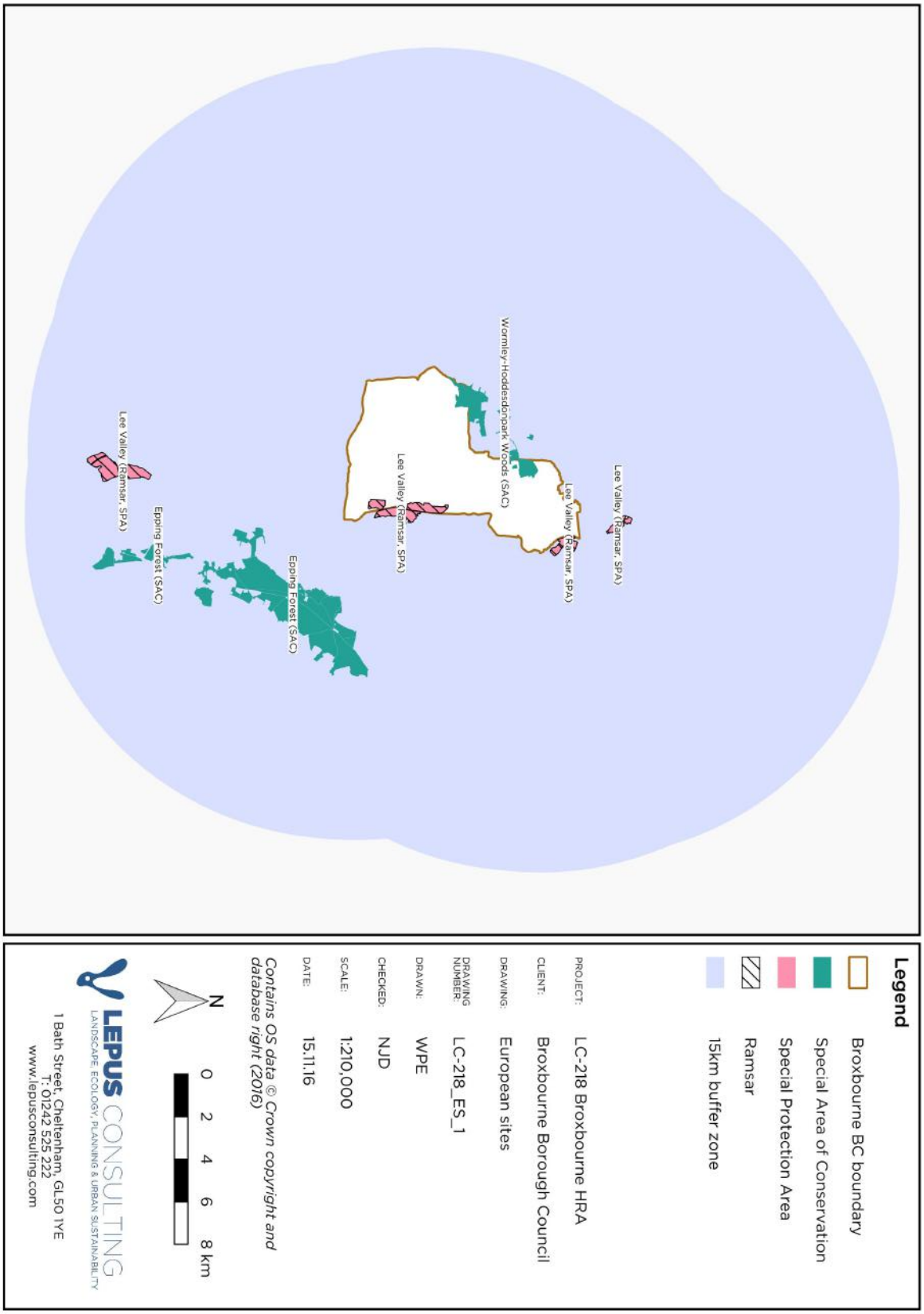


Figure 4.1: Map illustrating location of European Sites (SPAs, SACs and Ramsar sites) and a 15km buffer zone measured from the Borough of Broxbourne border.

Table 4.2: Summary screening of the draft Local Plan 2016 – 2031.

Section of the Plan	Screening Conclusion
Introduction	-
1. Introduction	Screened out (Category A)
Development Strategy	-
2. Vision and Objectives	Screened out (Category A)
3. Development Strategy	Screened out (Category A)
Places	-
4. Sustainable Place-Making	Screened out (Category A)
5. Brookfield	Screened in (Category I)
6. Broxbourne	Screened in (Category I)
7. Cheshunt	Screened in (Category I)
8. Goffs Oak and St. James'	Screened in (Category I)
9. Hoddesdon	Screened in (Category I)
10. Park Plaza	Screened in (Category I)
11. Waltham Cross	Screened in (Category I)
12. -Wormley and Turnford	Screened in (Category I)
13. Lee Valley Regional Park	Screened in (Category I)
14. Countryside	Screened out (Category D)
15. The New river	Screened out (Category D)
16. Gypsies, Travellers and Travelling Showpeople	Screened out (Category K)
Infrastructure and delivery	-
17. Infrastructure	Screened out (Category K)
18. Planning Obligations and CIL	Screened out (Category K)
19. Implementation	Screened out (Category K)
Development Management Policies	-

20. Housing	Screened out (Category K)
21. Economic Development	Screened out (Category K)
22. Retail and Town Centres	Screened out (Category K)
23. Open Space, Recreation and Community Facilities	Screened out (Category K)
24. Water	Screened out (Category D)
25. Green Belt	Screened in (Category I)
26. Natural Environment and Biodiversity	Screened out (Category D)
27. Environmental Quality	Screened out (Category D)
28. Heritage Assets	Screened out (Category K)
29. Transport and Movement	Screened out (Category K)
Appendices	-

Assessment and reasoning categories:

A: General statements of policy / general aspirations
B: Policies listing general criteria for testing the acceptability / sustainability of proposals
C: Proposal referred to but not proposed by the plan
D: Environmental protection / site safeguarding policies
E: Policies or proposals that steer change in such a way as to protect European sites from adverse effects
F: Policies or proposals that cannot lead to development or other change
G: Policies or proposals that could not have any conceivable or adverse effect on a site
H: Policies or proposals the (actual or theoretical) effects of which cannot undermine the conservation objectives (either alone or in combination with other aspects of this or other plans or projects)
I: Policies or proposals with a likely significant effect on a site alone
J: Policies or proposals not likely to have a significant effect alone
K: Policies not likely to have a significant effect either alone or in combination
L: Policies or proposals likely to have a significant effect in combination

4.2 Conservation objectives

4.2.1 The Waddenzee case[6] demonstrates that the effect of a Plan or Project on a European site cannot be considered to be significant if it '*is not likely to undermine its conservation objectives*'. The conservation objectives and qualifying features of each European site are presented in **Table A.1**. To help determine whether these conservation objectives will be undermined, this report considers whether any existing pressures on, or threats to, the site will be exacerbated.

4.3 Site pressures and threats

4.3.1 Site pressures and threats have been derived from data held by the JNCC on Natura 2000 Data Forms and Ramsar Information Sheets. These forms detail threats and pressures that would have a negative impact on the European sites. Site Improvement Plans (SIPs) have been developed for each European site as part of the Improvement Programme for England's Natura 2000 sites (IPENS). These set out an overview of current and predicted issues at the site. Information regarding pressures and threats from Natura 2000 Data Forms and SIPs are summarised in **Table B.1.** **Table 4.3** shows the filtered down list of issues that are discussed further in the following sections.

[6] European Commission Case C-127/02 Reference for a Preliminary Ruling 'Waddenzee' 07/9/2004 (para 45)

Table 4.3: Pressures and threats for European sites that may be affected by the Local Plan. Scoped out pressures and threats (**Section 4.4**) have been removed (SIP indicates data sourced from Site Improvement Plan, N2K indicates data also sourced from the JNCC Natura 2000 data forms).

Threats/ pressures	Epping Forest SAC[7,8]	Lee Valley SPA & Ramsar[9,10]	Wormley Hoddesdonpark Woods SAC[11,12]
Air pollution	H4010 Wet heathland with cross-leaved heath, H9120 Beech forests on acid soils (SIP + N2K)	A021 (NB) Bittern (SIP)	All qualifying features (SIP + N2K)
Public access and disturbance	H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths, H9120 Beech forests on acid soils (SIP + N2K)	All qualifying features (SIP + N2K)	
Vehicles: illicit			All qualifying features (SIP + N2K)
Water pollution	H4010 Wet heathland with cross-leaved heath (SIP)	All qualifying features (SIP + N2K)	

4.4 Scoping out pressures and threats

4.4.1 Each site in this assessment was identified as being under various threats and pressures. The following threats and pressures were identified for some of the sites in this assessment but have been scoped out of further discussion. This is because they are either beyond the influence of the draft Local Plan, were considered under a different but similar threat/pressure (for example, 'other human intrusions and disturbances' are considered under 'public access and disturbance') or are too vague to allow a meaningful analysis:

- Inappropriate scrub control;
- Fisheries: Fish stocking;
- Inappropriate cutting/mowing;
- Disease;
- Deer;

[7] JNCC (2015) Natura 2000 – Standard Data Form Epping Forest
[8] Natural England (2015) Site Improvement Plan Epping Forest
[9] Natural England (2015) Site Improvement Plan Lee Valley
[10] JNCC (2015) Natura 2000 – Standard Data Form Lee Valley
[11] Natural England (2015) Site Improvement Plan Wormley Hoddesdonpark Woods
[12] JNCC (2015) Natura 2000 – Standard Data Form Wormley Hoddesdonpark Woods

- Forestry and woodland management;
- Hydrological changes;
- Undergrazing;
- Changes in species distribution;
- Invasive species;
- Problematic native species;
- Other human intrusions and disturbances;
- Changes in biotic conditions;
- Grazing;
- Biocenotic evolution succession;
- Interspecific floral relations; and
- Marine and freshwater aquaculture.

4.4.2 **Table 4.3** displays the full list of European sites relevant to this assessment and the threats/pressures they are under that may be affected by the Local Plan (and were not screened out of assessment).

4.4.3 The vulnerability of each of the European sites to each of the threats and pressures listed in **Table 4.3** will now be examined in further detail. The impact the Local Plan will have on the vulnerability of each site will then be assessed.

4.5 Air pollution

4.5.1 Air pollution, in particular atmospheric nitrogen deposition, has been identified as a threat or pressure for qualifying features of Epping Forest SAC, Lee Valley SPA & Ramsar and Wormley Hoddesdonpark Woods SAC.

4.5.2 The primary source of nitrogen deposition in residential developments is road traffic. The European sites may be exposed to increased levels of air pollution as a result of increased traffic on nearby roads caused by the proposed developments in the Local Plan. The Design Manual for Roads and Bridges (DMRB) suggests that air quality impacts from vehicles are most likely to occur within 200m of a road[13].

[13] The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1: Air Quality

Vulnerability of Epping Forest SAC

4.5.3 Good air quality is recognised as a key environmental condition for Epping Forest SAC. At the site, wet heathland with cross leaved heath and beech forests on acid soils habitats are under pressure from poor air quality, with nitrogen deposition a particular concern.

4.5.4 A total of 38 SSSI units intersect with Epping Forest SAC. Of these, eight are considered to be in an 'Unfavourable – no change' state of conservation. One SSSI unit within Epping Forest SAC is in an 'Unfavourable – declining' state of conservation (Highams Park & The Sale SSSI). At each of these SSSI units, air pollution is given as the primary cause for unfavourability.

4.5.5 Leyton Flats & Hollow Pond SSSI, an SSSI unit within Epping Forest SAC and where the conservation status is 'Unfavourable – no change', is also under pressure from recreational disturbances. However, it is considered that the SSSI unit would be better able to cope with this recreation pressure if air pollution was absent.

4.5.6 Various signs of air pollution are noticeable throughout the site. Veteran trees show signs of stress, such as thin canopies and dieback of leading shoots. Bramble and nettle growth is excessive and there is significantly more grass growth than broad-leaved species.

4.5.7 Lichens are a sensitive and natural indicator of air pollution. The number of lichen species in Epping Forest SAC reduced from initial levels of over 150 to approximately 90 by the end of the nineteenth century. In 1970 when air pollution was at it's worst there were only 28 species remaining whilst today there are thought to be around 60, nitrogen pollution tolerant, species.

4.5.8 Busy roads fragment Epping Forest SAC, with an estimated 45,000 vehicles passing through the Wake Arms roundabout in the centre of the site every weekday[14]. Concentrations of atmospheric nitrogen are approximately three times higher than the recommended limit above which plant health is threatened up to 200m from the main roads[15].

[14] Epping Forest – The next 10 years (2013). Accessed online at: consult.cityoflondon.gov.uk
[15] Epping Forest – The next 10 years (2013). Accessed online at: consult.cityoflondon.gov.uk

4.5.9 European dry heaths and Northern wet heath: *Erica tetralix* dominated wet heath habitats have a nitrogen deposition critical load of 10 – 20 kg N/ha/year. In Epping Forest SAC, they're currently exposed to an average of 16.2 kg/N/ha/year with a minimum of 14.8 kg/N/ha/year and a maximum of 24.6 kg/N/ha/year. Broadleaved deciduous woodland and *Fagus* woodland have critical loads of 10 – 20 kg/N/ha/year. In Epping Forest SAC, they're currently exposed to an average of 27.5 kg/N/ha/year, with a minimum of 25.1 kg/N/ha/year and a maximum of 43.4 kg/N/ha/year. Nitrogen deposition at Epping Forest SAC therefore significantly exceeds the critical loads.

Effects of the Local Plan on air pollution at Epping Forest SAC

4.5.10 The Conservators of Epping Forest (see **Section 4.6.10**) and Essex County Council Highways agreed to act on the air pollution issue at Epping Forest SAC and committed to The Epping Forest Transport Strategy 2009 – 2016. Central to this strategy is to "*retain the diversity of wildlife habitats and the features of international importance*"[16]

4.5.11 The Epping Forest Transport Strategy proposals include measures to make Epping Forest a noticeably unique and special landscape. It aims to slow and reduce traffic passing through the forest. Suggestions include quiet traffic lanes, heavy goods vehicles routes and traffic calming zones (i.e. speed bumps and fencing). The strategy plans to review speed limits, junction layouts, speed warning technology, road sign usage and road sign design. Lastly, the strategy aims to make more sustainable transport options as attractive as possible, such as with cycle networks and public transport options[17].

4.5.12 Overall, the Epping Forest Transport Strategy may slow traffic in some areas and reduce congestion in others. However, there is a remaining concern that the Transport Strategy may not fully address the challenge of tackling air pollution in Epping Forest SAC given the severity of the situation and the significant consequences already incurred.

4.5.13 Epping Forest SAC is approximately 7km to the southeast of Broxbourne Borough. The A104 and A121 are major roads running from the south of the district and through the body of the site, frequently within 200m of its qualifying features. The site is also within 200m of the M25 at two different locations.

[16] Epping Forest Transport Strategy proposals 2009 – 2016, accessed online at: www.essex.gov.uk
[17] Ibid

4.5.14 The 2011 census found that 45.0% of Broxbourne residents commuted to areas outside of the district[18]. The majority of these commuters are travelling to London, Enfield, Welwyn Hatfield and East Hertfordshire. Commuters to these areas from Broxbourne Borough do not increase traffic in the vicinity of Epping Forest SAC.

4.5.15 The 2011 census found that a total of 1,576 commuters live in Broxbourne and travel to Epping Forest for work, whilst a total of 1,781 people live in Epping Forest and travel to Broxbourne for work[19]. This suggests an overall net migration of people from the immediate vicinity of Epping Forest to the Borough for work.

4.5.16 There are various proposals in the Local Plan that would increase employment in the Borough, including a 100,000m^2 business park at Park Plaza West, 1,500 general industry jobs at Maxwell's Farm West and 47,000m^2 employment land as part of the mixed-use scheme at Brookfield. The Local Plan proposes the creation of a total 6,000 – 7,000 jobs. This may reduce the proportion of Broxbourne residents commuting out of the borough for work.

4.5.17 Epping Forest SAC is suffering the adverse consequences of poor air quality. None of the developments are within 200m of the site and increases in traffic in the immediate vicinity of the site as a result of the Local Plan are expected to be negligible. It is therefore considered that based on the information currently available, a likely significant effect on Epping Forest SAC due to air pollution can be objectively ruled out.

Vulnerability of Lee Valley SPA & Ramsar

4.5.18 The great bittern (*Botaurus stellaris*) is identified as being under threat from low air quality, in particular atmospheric nitrogen deposition, at Lee Valley SPA & Lee Valley Ramsar.

[18]Borough of Broxbourne Council (2016) Review of Objectively Assessed Housing Need Final Report May 2016
[19] Ibid

4.5.19 A total of 24 SSSI units intersect Lee Valley SPA & Ramsar. Twelve of these are considered to be in an 'Unfavourable – recovering' state of conservation, whilst the remaining twelve are considered to have a 'Favourable' conservation status. Where sites have an 'Unfavourable – recovering' status, the reasoning is predominantly due to breeding heron numbers not meeting the minimum threshold and is not related to air quality. In some SSSI units north of the district, the population of breeding pairs of common tern and the non-breeding population of tufted duck are currently unfavourable.

4.5.20 The site is home to various habitats that have different critical loads of nitrogen deposition. Areas of rich fens, relevant to the great bittern, have a critical load of 15 – 30 kg/N/ha/year. Areas of low and medium altitude hay meadows, relevant to the northern shoveler, have a critical load of 20 – 30 kg/N/ha/year. Both these habitats of the site are currently exposed to an average of 17.7 kg/N/ha/year, with a maximum of 24.6 kg/N/ha/year and a minimum of 16.2 kg/N/ha/year. Other areas of the site that are relevant to populations of northern shoveler and gadwall have no comparable habitat and critical loads are not available. These sites are currently exposed to an average of 12.8 kg/N/ha/year. Overall, average nitrogen deposition in habitats of the bittern is in the range of the critical load.

Effects of the Local Plan on air pollution and Lee Valley SPA & Ramsar

4.5.21 The great bittern is a wading bird restricted almost entirely to reed-dominated wetlands where they feed on fish, amphibians and other small water animals. Nitrogen deposition in excess of the critical loads can lead to the eutrophication and degradation of this habitat.

4.5.22 The Cheshunt Lakeside developments proposed for Delamare Road includes an urban village of 1,000 dwellings, various businesses and business floor space, a primary school and landscaped open space. A small proportion of these developments will be within 200m of Lee Valley SPA & Ramsar.

4.5.23 It is considered unlikely this development, the majority of which will involve replacing industrial land uses with residential, will impact on air quality at Lee Valley SPA & Ramsar.

4.5.24 The developments in the Local Plan may lead to an increase in overall traffic within the borough. Main roads running through the Borough include the A10 and A1170. Both these roads are significantly more than 200m from Lee Valley SPA & Ramsar. It is likely that the developments will increase traffic significantly on Delamare Road, which is over 200m from the SPA.

4.5.25 Based on the information currently available, it is considered that a likely significant effect on Lee Valley SPA & Ramsar due to air pollution can be objectively ruled out.

Vulnerability of Wormley Hoddesdonpark Woods SAC

4.5.26 The qualifying feature 'sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli'* has been identified as under threat from atmospheric nitrogen deposition in Wormley Hoddesdonpark Woods SAC.

4.5.27 Of the 25 SSSI units that intersect with the site, 21 are considered to be in a 'Favourable' state of conservation. Two SSSI units are considered to be in an 'Unfavourable – recovering' state whilst the remaining two are considered to be in a state of 'Unfavourable – no change'. The causes of units not being in a 'Favourable' state are not related to air quality. For example, 'Foulwells Marsh & Grandsire Grove (006) SSSI' is in an 'Unfavourable – no change' state due to poor management allowing trees and scrub to encroach on wet grasslands that are host to rare species of plants. Although the site is currently exposed to poor air quality (see **Section 4.5.27**), sensitive features of the site are currently in a favourable condition.

4.5.28 The critical load class of Meso- and eutrophic *Quercus* woodland, relevant to oak hornbeam forests, has a critical load of 15 – 20 kg/N/ha/year. At Wormley Hoddesdonpark Woods SAC they are currently exposed to an average of 25.7 kg/N/ha/year, with a minimum of 24.8 kg/N/ha/year and a maximum of 30.9 kg/N/ha/year. N deposition in this site is therefore significantly exceeding the critical load.

Effects of the Local Plan on Wormley Hoddesdonpark Woods SAC

4.5.29 Despite nitrogen deposition being in excess of critical loads at the site, and the risk of harmful consequences of this, the qualifying features of the site are thus far in a favourable condition. However, the JNCC recognises air pollution as being a significant threat to the future condition of oak-hornbeam forest habitats[20].

4.5.30 None of the options for development are within 200m of Wormley Hoddesdonpark Woods SAC. The integrity of the site may be undermined by air pollution from increases in traffic in the immediate vicinity. The main road White Stubbs Lane and the minor roads Cock Lane and Lord Street provide access to the site from the borough. Each of these roads lies within 200m of the site at multiple locations.

4.5.31 The significant majority of the commuters of Broxbourne are travelling to London, Enfield, Welwyn Hatfield and East Hertfordshire (see **Section 4.5.14**). Cock Lane and Lord Street are country roads that don't offer a commuting route for residents of Broxbourne. Increases in traffic on these roads caused by the Local Plan are considered to be negligible. White Stubbs Lane may represent the best route of commute for residents of the 153 dwellings proposed for Broxbourne School of the Local Plan. For all other residents, the A10 leading on to the M25 offers a more efficient route of commute.

4.5.32 Developments in the Local Plan are not expected to lead to a reduction in air quality at Wormley Hoddesdonpark Woods SAC. Based on the information currently available, a likely significant effect can be objectively ruled out.

Air Quality Management Areas (AQMAs)

4.5.33 Since December 1997 local authorities in the UK have been designating AQMAs in areas where national air quality objectives are thought unlikely to be achieved. Each local authority developed a Local Air Quality Action Plan to tackle air pollution in these areas.

[20] Joint Nature Conservation Committee (2007) Second report by the UK under Article 17 on the Implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: http://www.jncc.gov.uk/article17

4.5.34 In the Borough of Broxbourne both of the roundabouts on the A121 near Waltham Cross are covered by an AQMA. In the Local Plan, development proposals for the Bury Green Area and Park Plaza Area will cause an increase in traffic on these roundabouts. This may make achieving targets in the Local Air Quality Action Plan more difficult. The draft Local Plan includes Policy EQ1: Air Quality, wherein developments must consider and mitigate effects on air quality whilst development proposals that exceed EU limit values will be refused.

4.6 Public access and disturbance

4.6.1 Public access and associated disturbances have been identified as a threat for Epping Forest SAC, Lee Valley SPA & Ramsar and Wormley Hoddesdonpark Woods SAC.

Vulnerability of Epping Forest SAC

4.6.2 Controlled recreational activity is identified as a key environmental condition at Epping Forest SAC. Wet heathland with cross-leaved heath, European dry heaths and beech forests on acid soils in Epping Forest SAC are currently under significant recreational pressure.

4.6.3 Of the 38 SSSI units intersecting with Epping Forest SAC, eight of them are in a state of 'Unfavourable – no change'. Recreational pressure is not identified as the main cause of unfavourability for any of these SSSI units. However, recreational pressures are identified as the secondary cause of the 'Unfavourable – no change' status of Leyton Flats & Hollow Pond SSSI. A 2014 survey found that Hollow Ponds is the most popular site of Epping Forest, attracting 11% of the total number of visitors[21].

4.6.4 Epping Forest covers approximately 2,400 hectares, of which Epping Forest SAC comprises 1,600 hectares. There are high levels of footfall spread throughout the year and in 2014 it was estimated Epping Forest receives 4,271,398 visitors annually[22]. 36.6% of 11,144 people surveyed between 2010 and 2014 were there for walking, 17.5% for walking their dog(s) whilst 10.6% were cycling. Epping Forest is known as a popular location for mountain bikers and is used as a training area for national level races. Other popular activities include running, horse riding, fishing and playing football.

[21] City of London (2014) Epping Forest Visitor Survey 2014 Results Report
[22] City of London (2014) Epping Forest Visitor Survey 2014 Results Report

4.6.5 High visitor numbers have significant implications for soil health by increasing levels of compaction and erosion. Wilson and Seney concluded in their 1994 study that walkers and horse riders cause more soil erosion in wet conditions than cyclists and motorcyclists[23]. Dogs have significantly adverse effects on the site's ecosystem by depositing nutrient rich faeces and urine and by disturbing wild fauna.

4.6.6 According to the 2014 survey, 95% of visitors to Epping Forest SAC live within 2km of the site. The survey splits the site in to three areas, namely the north, centre and south. More than half of visits to the site are to the south area, which receives 3,083 visits per hectare. In contrast, the north receives 662 visits per hectare[24].

Effects of the Local Plan on public access related disturbances at Epping Forest SAC

4.6.7 England Day Visits survey data indicates that residents are willing to travel up to 18km to visit large woodland sites. All developments proposed in the Local Plan are within 18km of Epping Forest SAC. This equates to 3,993 – 6,030 new dwellings being within the zone of influence for the site.

4.6.8 Residents of the new developments will have easy access to the site. The A10 spans the district and joins the M25, which runs along the southern edge of the district on to the northern edge of Epping Forest SAC. The A112 provides visitors with access to southern areas of the site. By car, it would take approximately 14 minutes to reach the north of the site from developments proposed in the Park Plaza Area. To reach the southern half of the site would take approximately an additional four minutes. Public transport also provides access to most locations in and around the forest.

4.6.9 However, the 2014 visitor survey indicated 95% of visitors come from within 2km of the site. None of the options for development in the Local Plan are within 2km of Epping Forest SAC. Lee Valley SPA & Ramsar and Wormley Hoddesdonpark Woods SAC offer alternative, and closer, natural spaces to residents of Broxbourne than Epping Forest SAC. It is therefore considered unlikely that visitor numbers at the site will increase significantly as a result of the proposed developments in the Local Plan.

[23] Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off road bicycles on mountain trails in Montana. Mountain Research and Development 14:77-88
[24] City of London (2014) Epping Forest Visitor Survey 2014 Results Report

4.6.10 The City of London is currently consulting the general public on its new 'Management Plan for Epping Forest' for the period 2017 – 2027. Their aim is to continue the protection, conservation and public enjoyment of Epping Forest. The forest is governed by The Conservators of Epping Forest, who are charged with the responsibility of safeguarding the Forest under the Epping Forest Act 1878.

4.6.11 The potential for further onsite management measures that mitigate the effects of recreational pressures is severely limited, although significant success has been achieved already. There are frequent surveys of visitors orchestrated by the City of London. The selection and promotion of 'honeypot sites' has helped to effectively manage the flow and density of visitors throughout the site. Large-scale events, such as cross-country runs, require permission from the Corporation of London whilst horse riders must be registered with the Epping Forest Conservators.

4.6.12 Based on the information currently available, it is considered that a likely significant effect on Epping Forest SAC because of increased public access associated disturbances can be objectively ruled out.

Vulnerability of Lee Valley SPA & Ramsar

4.6.13 Minimal disturbance is recognised as a key environmental condition for Lee Valley SPA & Ramsar, a site which covers an area of 447.87 ha. It sits within the 4,000ha Lee Valley Regional Park; a popular park that receives approximately 4.4 million visits a year[25]. The SPA is comprised of numerous reservoirs and gravel pits, each with differing levels of access to the public.

4.6.14 The great bittern (*Botaurus stellarisx*), gadwall (*Anas strepera*) and northern shoveler (*Anas clypeata*) are all under threat from public access and associated disturbances in Lee Valley SPA & Ramsar. Recreational pressures including water sports, angling and dog walking have the potential to negatively effect populations.

4.6.15 Gadwall and shoveler birds that winter at Lee Valley SPA & Ramsar are not confined to the geographical boundaries of the site and will rely heavily on areas of supporting habitat up to 2km away.

[25]Lee Valley Regional Park Authority (2011) Performance Management – Annual Report

4.6.16 Of the 24 SSSI units assigned a conservation status that intersect with Lee Valley SPA & Ramsar, twelve are in a 'Favourable' state whilst the remaining twelve are in an 'Unfavourable – recovering' state. Disturbances associated with public access are not the cause of unfavourability. The site receives a large number of visitors (see **Section 4.6.13**) but sensitive features are not yet showing signs of negative consequences of this.

4.6.17 Birds are considered to be more able to habituate to frequent and benign events, such as being interrupted by hikers, than major events such as disturbances by aeroplanes[26]. Birds that make use of Lee Valley SPA & Ramsar are within a relatively urban area with a nearby train line, various roads and large numbers of visitors. It is considered likely that birds at the site are habituated to a high level of background disturbance and the presence of humans.

4.6.18 Impacts associated with recreational disturbances vary between locations, seasons, species and individuals. Impacts may be direct, such as birds being forced to flee oncoming boats, or indirect, such as the destruction of habitats. Disturbances may lead to behavioural changes, such as the avoidance of particular areas or changes to feeding habits, and physiological changes, such as quicker heartbeat rates. Whilst recreational activities are reduced during winter, food is scarce at this time of year and so interruptions to foraging birds can be particularly damaging.

4.6.19 The adverse effects of unnecessary expenditure of energy by birds flying away from oncoming threats, coupled with the reduction in their intake of energy as a result of less time spent foraging, can be significant for the balance between birth/immigration and death/emigration.

Effects of the Local Plan on public access related disturbances at Lee Valley SPA & Ramsar

4.6.20 There are four areas of Lee Valley SPA within 15km of the border of Broxbourne Borough. Walthamstow Reservoirs represent the area of the SPA south of the district. These reservoirs are just under 15km south of the district's border at their closest point, with the majority of the reservoirs being 15 – 20km from the district. Recreational access to these reservoirs is controlled via permits. It is therefore considered unlikely that the Local Plan will have any adverse impacts on this part of the SPA, and it will no longer be included in the assessment.

[26] Hill, D., Hockin, D., Price, D., Tucker, G., Morris, R., & Treweek, J. (1997). Bird disturbance: improving the quality and utility of disturbance research. Journal of Applied Ecology, 275-28

4.6.21 The corresponding SSSI for the area of the SPA in the southeast corner of the district is Turnford & Cheshunt Pits SSSI. For the area of the SPA just outside the northeast corner of the district the corresponding SSSI is Rye Meads. The corresponding SSSI for the area of the SPA to the north of the district is Amwell Quarry SSSI.

4.6.22 Turnford & Cheshunt Pits SSSI and Amwell Quarry SSSI are in a 100% 'Favourable' state of conservation. 39.95% of Rye Meads SSSI is in a 'Favourable' condition whilst the remainder is in an 'Unfavourable – recovering' condition. The causes of unfavourability of some units at Rye Meads SSSI are the non-breeding population of tufted duck and breeding pairs of common tern. Neither of these species represents a qualifying feature of the site.

4.6.23 At each SSSI, a mosaic of wet grasslands, open waters, swamps and reedbeds are recognised as being in a favourable condition for supporting the gadwall, shoveler and great bittern.

4.6.24 Turnford & Cheshunt Pits SSSI includes ten former gravel pits with 7.2km of shoreline. It's host to important concentrations of gadwall, shoveler and bittern[27]. Rye Meads SSSI covers 58.5ha and meadows of the site are the last substantial remnants of ancient flood-meadows on the rich alluvial soils of the Lee Valley. The lagoons here support important concentrations of gadwall and shoveler[28]. Amwell Quarry SSSI covers 36.96ha and is a former gravel pit that hosts important concentrations of gadwall, shoveler and bittern[29].

4.6.25 Overall, these areas of the SPA are well managed with conservation and wildlife a key factor in management approaches. Turnford & Cheshunt Pits SSSI is one of three SSSIs within the 1,000-acre River Lee Country Park, which is managed by a statutory body called the Lee Valley Regional Park Authority (LVRPA). Recreational pressures are regulated through the zoning of water bodies within the Lee Valley Regional Park. An agreed management plan, within which nature conservation is a significant priority, is in place. The LVRPA has a wide remit that includes, in part, being "*responsible for regenerating derelict and neglected land into high quality public open spaces and wildlife habitats of ecological importance*"[30].

[27] Turnford & Cheshunt SSSI. Natural England. Accessed online: www.sssi.naturalengland.org.uk
[28] Rye Meads SSSI District, Natural England. Accessed online: www.sssi.naturalengland.org.uk
[29] Amwell Quarry SSSI. Natural England. Accessed online: www.sssi.naturalengland.org.uk
[30] Lee Valley Regional Park Authority (2016) About Us. Accessed online: http://www.leevalleypark.org.uk

4.6.26 Rye Meads SSSI is within Rye Meads Nature Reserve, which is managed jointly by the Royal Society for the Protection of Birds (RSPB) and Herts & Middlesex Wildlife Trust. Amwell Quarry SSSI sits within the Amwell Nature Reserve, which is managed by the Herts & Middlesex Wildlife Trust. Visits to this reserve are actively encouraged with tracks, accessible to all, available around the site.

4.6.27 Overall, management of public access and associated recreational pressures at Lee Valley SPA & Ramsar is considered to be positive and effective, with most negative consequences of visitors successfully mitigated.

4.6.28 A train line runs parallel to Turnford & Cheshunt Pits SSSI. If travelling by car residents of Broxbourne would have to circumnavigate this line to reach the site, or cross a bridge by foot. This is the only impediment to resident's access to the site. A variety of main roads throughout the district provide each of the options for development in the Local Plan with convenient access to the site.

4.6.29 Lee Valley SPA represents the closest water body site for the residents of the district. A total of 7,408 new dwellings are proposed for the borough by 2031. Applying the England average number of people per dwelling of 2.4[31], this would result in approximately 17,780 new residents living within 5km of the SPA.

4.6.30 Based on the information currently available, a likely significant effect on Lee Valley SPA & Ramsar because of public access associated disturbances, caused by the Local Plan, cannot be objectively ruled out.

Vulnerability of Wormley Hoddesdonpark Woods SAC

4.6.31 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli* are recognised as being under threat from public access and associated disturbances at Wormley Hoddesdonpark Woods SAC.

4.6.32 The site is a large, attractive area of ancient woodland with extensive public access that is close to large urban areas. It is therefore under heavy use by the public for recreational purposes, although most recreation is considered to take place on well-established paths.

[31] Office for National Statistics (2011) 2011 Census: Population and household estimates for the United Kingdom, March 2011

4.6.33 Of the 25 SSSI units designated a conservation status that intersect with Wormley Hoddesdonpark Woods SAC, 21 are in a 'Favourable' state of conservation. Two are in an 'Unfavourable – recovering' state whilst two are in an 'Unfavourable – no change' state. Unfavourability is a result of imported waste material and poor management of encroaching scrub, and not related to public access associated disturbances.

4.6.34 Absence of direct fertilisation is a key environmental condition for the site and its qualifying features. Dog fouling therefore represents a major threat to the integrity of the site.

4.6.35 The most recent Natural England condition assessment of Wormley Hoddesdonpark Woods SAC recorded that recreational activity on the site is well controlled, with most visitors sticking to the clearly defined footpaths. These footpaths become difficult to navigate when wet, and so recreational use of the woods is often not as high as may be expected.

Effects of the Local Plan on public access related disturbances at Wormley Hoddesdonpark Woods SAC

4.6.36 Wormley Hoddesdonpark Woods SAC is part of the Broxbourne Woods National Nature Reserve and owned by The Woodland Trust. The site is currently covered with a High Forest Zone Plan that sets out a framework for woodland management. The Woodland Trust has plans in place that aim to restore the varied age structure and natural stand types to the forest through sustainable techniques.

4.6.37 Sensitive management of access points and routes in to the site have been largely successful in mitigating negative effects of public access. The site is split in to the 192.5ha Wormley Hoddesdonpark Woods South SSSI and the 143.9ha Wormley Hoddesdonpark Woods North SSSI. The qualifying features in both areas are predominantly in a favourable condition and any unfavourability is not a result of recreational pressures.

4.6.38 Visitor survey data on Wormley Hoddesdonpark Woods SAC is extremely limited. England Day Visits survey data indicates residents are willing to travel up to 18km to visit large woodland sites. The Local Plan would result in approximately 17,790 new residents within 10km of the site, which is easily accessible for all via the A10 and White Stubbs Lane.

4.6.39 The draft Local Plan cites the MORI Survey 2013 which revealed 86% of residents are fairly or very satisfied with Broxbourne as a place to live. A key reason for this is the parks and green spaces on offer. There are various greenspaces available to the residents of the borough, including Lee Valley Regional Park, Epping Forest and numerous parks. It is unlikely that many residents will travel further to use Wormley Hoddesdonpark Woods SAC for frequent recreational purposes such as dog walking.

4.6.40 Qualifying features of the site are coping well with current visitor numbers and are not expected to be effected by a minor increase. Based on the information currently available, a likely significant effect on Wormley Hoddesdonpark Woods SAC because of the Local Plan can be objectively ruled out.

4.7 Illicit vehicles

4.7.1 Illicit vehicles have been identified as a pressure on the oak-hornbeam forests of Wormley Hoddesdonpark Woods SAC. Illegal use of restricted byways and bridleways by off-road vehicles causes localised, but significant, compaction of soil and damage to flora. Fly tipping of waste also introduces toxins and alien species to the ecosystem.

4.7.2 Of the 25 SSSI units assigned a conservation status that intersect with the site, two of them are in an 'Unfavourable – no change' state. The cause of unfavourability for one of these SSSI units is waste material, including rubble and metal, sitting heaped in the field.

4.7.3 Wormley Hoddesdonpark Woods SAC is within 10km of all residential options of the Local Plan. Various roads off the A10, such as White Stubbs Lane, provide convenient access to legal entry sites for the park.

4.7.4 The areas being damaged by illicit vehicles and the entry points and routes used for access are still being identified. Broxbourne has a variety of green spaces available to its residents, many of them closer to the housing options of the Local Plan than Wormley Hoddesdonpark Woods SAC.

4.7.5 Only one of 25 SSSI units is suffering the consequences of illicit vehicles and plans are in place to tackle this existing problem. The site has many legal access options and is one of multiple green spaces available to new residents. A likely significant effect on the Sac, because of illicit vehicles caused by the Local Plan, can be objectively ruled out based on the information currently available.

4.8 Water pollution

4.8.1 Water pollution has been identified as a threat for the wet heathland with cross-leaved heath of Epping Forest SAC and all qualifying features of Lee Valley SPA & Ramsar.

Epping Forest SAC

4.8.2 Wet heath, particularly at the edges, is being affected by poor quality surface run-off water from roads with elevated levels of pollutants, nutrients and salinity.

4.8.3 Epping Forest SAC is at least 6km from all developments proposed in the draft Local Plan. It is therefore not considered likely that the Local Plan would undermine the integrity of Epping Forest SAC by increasing the threat of water pollution.

Lee Valley SPA & Ramsar

4.8.4 Habitat and food sources for the gadwall, northern shoveler and great bittern are identified as being under threat at Lee Valley SPA & Ramsar. Vegetation and invertebrates are a food source for ducks while fish act as a food source for the bittern. The habitat mosaic needs to vary from clear open water with abundant vegetation to moderately eutrophic conditions.

4.8.5 Numerous options for development in the draft Local Plan are in the immediate vicinity of Lee Valley SPA & Ramsar. For developments to affect the water quality of the site, there needs to be sufficiently functionally linked wetland.

4.8.6 The closest development options of the Local Plan to the waters of Lee Valley SPA & Ramsar those on Delamare Road and Nazeing Road. The Cheshunt Lakeside proposal on Delamare Road includes 1,000 dwellings approximately 700m west of the SPA, and 400m west of Cheshunt Lake, a water body sitting between Delamare Road and the SPA. The green buffer between the developments and water of the SPA make the threat of water pollution undermining the integrity of the SPA unlikely.

4.8.7 No options considered in the Local Plan could feasibly impact the water quality of Lee Valley SPA & Ramsar. Based on the currently available information, a likely significant effect on the SPA because of water pollution caused by the Local Plan can be objectively ruled out.

5 Conclusions and Recommendations

5.1 Assessment findings

5.1.1 This assessment considered four SACs, SPAs and Ramsar sites within 15km of the border of the Broxbourne Borough.

5.1.2 This HRA report has outlined the threats and pressures that have the potential to undermine the conservation objectives of each European site included.

5.1.3 A likely significant effect of the Local Plan on the conservation objectives of Epping Forest SAC and/ or Wormley Hoddesdonpark Woods SAC can be objectively ruled out based on the information currently available.

5.1.4 A likely significant effect on Lee Valley SPA & Ramsar because of water and/ or air pollution caused by the Local Plan can be objectively ruled out based on the information currently available.

5.1.5 A total of 7,408 dwellings are proposed for Broxbourne which would result in approximately 17,780 new residents within 5km of Lee Valley SPA & Ramsar. A likely significant effect of the subsequent increase in public access and associated disturbances at the SPA cannot be objectively ruled out based on the information currently available see **Section 4.6.20 – 4.6.30**).

5.2 Next steps

5.2.1 This report is subject to comments and review by the client team and will then be subject to consultation with Natural England. Any responses from Natural England will be taken into account and this report will be reviewed and amended if possible.

5.2.2 If, after consultation, it is still considered that the Local Plan would have likely significant effects on the integrity of Lee Valley SPA & Ramsar, mitigation efforts may be incorporated in to the plan. If likely significant effects can still not be ruled out after additional screening of the plan, an Appropriate Assessment may be required to identify suitable mitigation measures.

5.3 Recommendations

5.3.1 To mitigate the pressure of public access associated disturbances on Lee Valley SPA & Ramsar, caused by developments in the Local Plan, the following mitigation measures could be considered:

- Encourage visitors to visit areas of the site not habituated by gadwall, shoveler or bittern populations;
- Reduce public access during winter months in areas habituated by gadwall, shoveler or bittern populations;
- Help alter public perception of the Lee Valley SPA & Ramsar, including its qualifying features, so its special conservation status is recognised, appreciated and enforced by visitors; and
- Increase funding for management of Lee Valley SPA & Ramsar with contributions from developers of all new properties within 15km of the site.

APPENDIX A

Table A.1: European sites and their conservation objectives (where available from Natural England).

Epping Forest SAC

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Qualifying Features:

- H4010: Northern Atlantic wet heaths with *Erica tetralix*; Wet heathlands with cross-leaved heath
- H4030: European dry heaths
- H9120: Atlantic acidophilous beech forests with *Ilex* also *Taxus* in the shrublayer (*Quericon robori-petraeae or Ilici-Fagenion*); Beech forests on acid soils
- S1083: *Lucanus cervus*; Stag beetle

Lee Valley SPA

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying features, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which qualifying natural habitats rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

Qualifying Features:

- A021 *Botaurus stellaris;* Great bittern (Non-breeding)
- A051 *Anas strepera;* Gadwall (Non-breeding)
- A056 *Anas clypeata;* Northern shoveler (Non-breeding)

Lee Valley Ramsar

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying features, by maintaining or restoring;

Ramsar Criterion	Justification for the application of each Criterion
2	Ramsar criterion 2 - the site supports the nationally scarce plant species: • Whorled water-milfoil *Myriophyllum verticillatum*; and • The rare or vulnerable invertebrate *Micronecta minutissima* (a water-boatman).
6	Ramsar criterion 6 – species/populations occurring at levels of international importance. **Qualifying species/populations with peak counts in spring/autumn:** • Northern shoveler, *Anas clypeata*, NW & C Europe (287 individuals). **Qualifying species/populations with peak counts in winter:** • Gadwall, *Anas strepera strepera,* NW Europe (445 individuals).

Wormley Hoddesdonpark SAC

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which qualifying natural habitats rely;

Qualifying Features:

- H9160: Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*

APPENDIX B

Table B.1: Pressures and threats for European sites that may be affected by the Local Plan. Boxes with a cross indicate the site is vulnerable to that particular threat/pressure, but the individual qualifying features under threat/pressure have not been identified (applicable to data provided by Natura 2000 data forms).

Note: SIP indicates data was sourced from Site Improvement Plans. N2K indicates data was sourced from Natura 2000 data forms.

	Threats/ pressures	Lee Valley SPA & Ramsar	Epping Forest SAC	Wormley Hoddesdonpark SAC
Information from SIPs and Natura 2000 data forms	Water pollution	All qualifying features (SIP + N2K)	Wet heathland with cross-leaved heath	
	Hydrological changes	All qualifying features (SIP + N2K)	Wet heathland with cross-leaved heath (SIP + N2K)	
	Public access/ disturbance	All qualifying features (SIP + N2K)	Wet heathland with cross-leaved heath, European dry heaths and Beech forests on acid soils (SIP + N2K)	All qualifying features
	Inappropriate scrub control	All qualifying features		
	Fisheries: fish stocking	All qualifying features		
	Invasive species	All qualifying features	Wet heathland with cross-leaved heath and Beech forests on acid soils	All qualifying features (SIP + N2K)
	Inappropriate cutting/ mowing	Bittern		
	Air pollution: risk of atmospheric nitrogen deposition	Bittern	Wet heathland with cross-leaved heath and Beech forests on acid soils (SIP + N2K)	All qualifying features (SIP + N2K)
	Disease		Beech forests on acid soils	All qualifying features (SIP)
	Deer			All qualifying features (SIP)
	Vehicles: illicit			All qualifying features (SIP)
	Forestry and woodland management			All qualifying features (SIP)

	Undergrazing		Wet heathland with cross-leaved heath (SIP)	
	Changes in species distribution		Beech forests on acid soils (SIP)	
Information from Natura 2000 data forms only	Problematic native species			All qualifying features (N2K)
	Marine and freshwater aquaculture	All qualifying features (N2K)		
	Changes in biotic conditions		All qualifying features (N2K)	
	Grazing		All qualifying features (N2K)	
	Biocenotic evolution succession	All qualifying features (N2K)		
	Interspecific floral relations			All qualifying features (N2K)
	Other human intrusions and disturbances			All qualifying features (N2K)

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