



Ricardo
Energy & Environment

Oxfordshire Plan 2050 Habitats Regulations Assessment:

Distance-based risk-zones for Plan development

Report for Oxfordshire Plan Team

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1 Introduction

Ricardo Energy and Environment was commissioned by Oxford City Council, acting on behalf of a partnership of the five Oxfordshire district authorities¹, to undertake a Habitats Regulations Assessment (HRA) of how the emerging Oxfordshire Plan 2050 (“the Plan”) might affect designated European sites. The first stage of this HRA will involve screening the Plan for Likely Significant Effects (LSE) (HRA Stage 1) that would trigger the need for a full Appropriate Assessment (HRA Stage 2).

As the Plan has not yet been drafted, Ricardo was asked to undertake a pre-screening exercise to identify and map, at a high level, broad geographical areas that may pose potential risks to European sites from future development. This is to guide the Oxfordshire Plan Team in identifying broad areas of the county for future strategic development whilst avoiding, where possible, locations at higher risk of requiring detailed assessment and mitigation under the HRA process, due to the potential impacts on European habitat sites. The mapping of such higher risk zones or “buffers” is the aim of this pre-screening task, which is reported here.

These risk zones should not be interpreted as indicating that development within them will necessarily damage the integrity of European sites or undermine their conservation objectives. Rather, these zones serve only to highlight the possibility of strategic development within them needing a greater level of assessment under the Habitats Regulations, and potentially, a greater level of associated mitigation to overcome any adverse effects. The basic principle here is that the first consideration in the ‘mitigation hierarchy’ should be to avoid impacts wherever possible. The maps produced and described in this report are intended to facilitate such avoidance.

Whilst this work does not constitute a formal part of the HRA process, it is an initial step in helping to ensure that appropriate consideration and protection is afforded to European sites throughout the plan-making process.

2 Methodology

2.1 Study area

As a precautionary approach, all European-designated sites contained partially or wholly within a 20km radius of the five Oxfordshire district authorities are considered in this study. The use of a 20km buffer ensures that sites which are located relatively far from the Oxfordshire area, but which might be impacted by development within Oxfordshire due to exceptional pathways, are included in subsequent stages of the HRA process. Refer to Section 2.3 for additional information related to exceptional pathways.

2.2 Risk zones

In acknowledgement of the need for this to be a relatively simple and user-friendly output, the approach we have taken considers only two distance-based risk zones (‘buffers’) for each European site as follows.

2.2.1 Outer, precautionary buffer (lower risk zone)

Each European site will be represented with a standard precautionary buffer extending 10km from the European site boundary. This is a standard distance that Ricardo uses as a screening threshold in the

¹ Cherwell District Council, Oxford City Council, South Oxfordshire District Council, Vale of White Horse District Council and West Oxfordshire District Council

majority of our strategic Habitats Regulations Assessments e.g. those carried out for Thames Water's Draft Water Resource Management Plan (WRMP)² and Havant Borough Council's Local Plan³. This is a commonly applied screening threshold that has been agreed through consultation stages of HRA and typically accepted and used by Natural England for all but truly exceptional impact 'pathways' (e.g. routes for highly mobile species or impacts and functionally-linked off-site supporting habitats). 10km is also the maximum distance Impact Risk Zone (IRZ) used by Natural England to help planners and developers to screen for impacts to Sites of Special Scientific Interest (SSSI) and European sites⁴. This precautionary outer buffer therefore has significant precedent.

This lower-risk zone has been mapped using yellow shading (in keeping with a 'traffic-light' approach to colour-coding of risk areas).

2.2.2 Inner buffer (higher risk zone)

For each European site selected, we have looked at the sensitivities of its qualifying feature habitats and species based on the information provided in the original request for quotation, the district level HRAs that we have reviewed⁵, site citations⁶, IRZs⁴ and applicable Site Improvement Plans⁷ (SIPs) for each site. These primarily relate to sensitivities to air quality, water level, water quality and recreation.

Inner buffer distance for each type of impact were selected based on the following considerations:

- For air quality impacts, a screening distance of 200m between the road and European site has commonly been used in HRA. We have used a more precautionary distance of 500m, based on recent modelling work undertaken by Ricardo for HRA studies.
- For impacts related to water quality and water levels/abstraction, a 2km buffer has been selected as an initial screening distance to identify where there might be water related issues impacting a designated site. This buffer is based on the SSSI Impact Risk Zones (IRZ) approach for use by Local Planning Authorities to assess planning applications for likely impacts on designated sites⁸. The IRZ approach uses a number of different distance-based buffers as an initial screening test to determine where impacts could occur. In this case, the

² Thames Water, 2018. Revised draft Water Resources Management Plan 2019, Appendix C – Habitats Regulations Assessment.

³ Ricardo Energy & Environment, 2019. Air Quality Regulations Assessment for Havant Borough Local Plan 2036, Report for Havant Borough Council. Issue 3.

⁴ The Impact Risk Zones (IRZs) are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks posed by development proposals to: Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. They define zones around each site which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. See: <https://magic.defra.gov.uk/MagicMap.aspx>.

⁵ a) Atkins, 2017. Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Needs, Proposed Submission Plan, Habitat Regulations Assessment Screening Report. b) Atkins, 2018. Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Needs Proposed Submission Plan incorporating Focused Changes and Minor Modifications Habitat Regulations Assessment Stage 1 Screening Report and Stage 2 Appropriate Assessment. c) Oxford City Council, 2018. Oxford Local Plan 2036 Habitats Regulations Assessment: Appropriate Assessment. d) LUC, 2018. South Oxfordshire Local Plan 2034: Final Publication Version 2, Habitats Regulations Assessment Update Report. e) AECOM, 2018. Vale of White Horse LPP2, Habitats Regulations Assessment incorporating Appropriate Assessment. f) AECOM, 2018. West Oxfordshire Local Plan, Habitats Regulations Assessment incorporating Appropriate Assessment. g) CH2MHILL, 2015. Habitats Regulations Assessment Screening Report, Local Transport Plan 4 (2030), prepared for Oxfordshire County Council. h) Oxfordshire County Council, 2015. Oxfordshire Minerals and Waste Local Plan Part 1 – Core Strategy, Habitats Regulations Assessment Screening Report.

⁶ The Joint Nature Conservation Committee (JNCC) website provides information about individual designated sites, including SACs (<https://sac.jncc.gov.uk/site/>) and SPAs (<http://archive.jncc.gov.uk/page-1400>).

⁷ The Natural England website (<http://publications.naturalengland.org.uk/category/6149691318206464>) lists Site Improvement Plans (SIPs), by region, for individual designated sites.

⁸ Natural England, 2019. Natural England's Impact Risk Zones for Sites of Special Scientific Interest (For use by Local Planning Authorities to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites and determine when to consult Natural England).

2km buffers has been used as a minimum buffer to identify where any potential surface or groundwater impacts may occur.

- For recreational impacts, a buffer distance of 2km was selected for most European sites based on Natural England's IRZs for residential development. A larger buffer distance of 7km was selected for European sites identified as having a higher potential for recreational pressure impacts, specifically Wittenham SAC and Thames Basin Heaths SPA. A report by Natural England⁹ on engagement with the natural environment, which examined the distance travelled by people for visits to the outdoors, found that the distance travelled was less than 1 mile (1.6km) for 43% of visits, between 1 to 2 miles (1.6km to 3.2km) for 25% of the visits, between 3 to 5 miles (4.8km to 8.0km) for 15% of the visits and greater than 5 miles (8.0km) for 17% of the visits. While it is recognized that people may travel over 8km to reach a countryside location, we considered 2km and 7km to be suitable buffer distances for the purposes of this study.

For each European site, we have then selected what we consider to be a single appropriate inner buffer distance for that site based on the largest inner buffer related to its particular sensitivities. See Table 1 for a summary.

The inner buffer recognises that the outer 10km buffer is highly precautionary in many instances, and the likelihood of significant effects will still be very low in many places within that buffer. Therefore, this zone between each site's bespoke inner buffer and the standard 10km outer buffer allows greater spatial freedom for scenario development, whilst recognising some degree of risk. Within each site's chosen inner buffer, the risk of LSE, and therefore needing full Appropriate Assessment, is elevated further. The inner buffer represents a zone that may be best avoided, where possible, in the process of identifying broad locations for strategic scale development to avoid potential impacts on nature conservation, or used with caution if avoidance is not possible. It is important to note that these buffers are used as a high level guide only and the recommended buffer zone for HRA assessments is the wider 10km buffer. Once details of the plan are confirmed, a more detailed assessment of impacts and impact risk zones will be undertaken to determine what the likely type of impacts to water could occur and the area over which they may occur.

The selection of the appropriate inner buffer for each European site is based on professional judgement using existing sources of information rather than commissioning any site-specific detailed studies (e.g. on levels of recreation) or undertaking detailed stakeholder consultation (both of which would be undertaken as part of a future Stage 2 Appropriate Assessment). However, Natural England was consulted on this approach and feedback from Natural England has been taken into consideration (in particular see Section 2.3).

This higher-risk zone has been mapped using orange shading (in keeping with a 'traffic-light' approach to colour-coding of risk areas).

Table 1: Site criteria used to determine inner buffer distance

Site	Qualifying feature	Sensitivities	Maximum inner (higher-risk) buffer
Aston Rowant SAC	<ul style="list-style-type: none"> • <i>Juniperus communis</i> formations on heaths or calcareous grasslands 	Air Pollution Recreational Pressure	2km for recreational pressure

⁹ Natural England, 2015. Monitor of Engagement with the Natural Environment – The national survey on people and the natural environment, Annual report for the 2013-2014 survey.

Site	Qualifying feature	Sensitivities	Maximum inner (higher-risk) buffer
	<ul style="list-style-type: none"> Asperulo-Fagetum beech forests 		
Burnham Beeches SAC	<ul style="list-style-type: none"> Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) 	Air Pollution Recreational Pressure Water levels/abstraction Water Quality	2km for recreational pressure (also covers water effects) (Note: site is beyond 10km from Oxfordshire)
Chilterns Beechwoods SAC	<ul style="list-style-type: none"> Asperulo-Fagetum beech forests Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) Stag beetle <i>Lucanus cervus</i> 	Air Pollution Recreational Pressure Water levels/abstraction Water Quality	2km for recreational pressure (also covers water effects)
Cothill Fen SAC	<ul style="list-style-type: none"> Alkaline fens Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) 	Air Pollution Recreational pressure Water levels/abstraction Water Quality	2km for water effects (also covers any recreational pressure)
Hackpen Hill SAC	<ul style="list-style-type: none"> Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) Early gentian <i>Gentianella anglica</i> 	Air Pollution Recreational Pressure	2km for recreational pressure
Hartslock Wood SAC	<ul style="list-style-type: none"> Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) <i>Taxus baccata</i> woods of the British Isles 	Air Pollution Recreational Pressure	2km for recreational pressure
Kennet & Lambourn Floodplain SAC	<ul style="list-style-type: none"> Desmoulin`s whorl snail <i>Vertigo moulinsiana</i> 	Air pollution Water levels/abstraction Water quality	2km for water effects (also covers any recreational pressure)
Kennet Valley	<ul style="list-style-type: none"> Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> 	Air pollution Water levels/abstraction	2km for water effects (also covers

Site	Qualifying feature	Sensitivities	Maximum inner (higher-risk) buffer
Alderwoods SAC	(Alno-Padion, Alnion incanae, Salicion albae)		any recreational pressure) (Note: site is beyond 10km from Oxfordshire)
Little Wittenham SAC	<ul style="list-style-type: none"> Great crested newt <i>Triturus cristatus</i> 	Air pollution Recreational pressure Water levels/abstraction Water Quality	7 km for recreational pressure (greater distance due to greater draw of visitors according to existing study)
North Meadow & Clattinger Farm SAC	<ul style="list-style-type: none"> Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) 	Air Pollution Recreational pressure Water levels/abstraction Water Quality	2km for water effects (also covers any recreational pressure) (Note: site is beyond 10km from Oxfordshire)
Oxford Meadows SAC	<ul style="list-style-type: none"> Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) Creeping marshwort <i>Apium repens</i> 	Air Pollution Water levels/abstraction Water Quality Recreational pressure	2km for water effects (also covers any recreational pressure)
River Lambourn SAC	<ul style="list-style-type: none"> Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation Bullhead <i>Cottus gobio</i> Brook lamprey <i>Lampetra planeri</i> 	Water levels/abstraction Water quality	2km for water effects (also covers any recreational pressure)
Thames Basin Heaths SPA	<ul style="list-style-type: none"> Nightjar <i>Caprimulgus europaeus</i> Woodlark <i>Lullula arborea</i> Dartford warbler <i>Sylvia undata</i> 	Air Pollution Recreational Pressure	7km for recreational pressure (Note: site is beyond 10km from Oxfordshire)
Windsor Forest & Great Park SAC	<ul style="list-style-type: none"> Old acidophilous oak woods with <i>Quercus robur</i> on sandy plains Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrublayer 	Air Pollution Water levels/abstraction Water Quality Recreational pressure	2km for recreational pressure (also covers water effects)

Site	Qualifying feature	Sensitivities	Maximum inner (higher-risk) buffer
	(Quercion robori-petraeae or Ilici-Fagenion) <ul style="list-style-type: none"> • Violet click beetle <i>Limoniscus violaceus</i> 		(Note: site is beyond 10km from Oxfordshire)

2.2.3 Areas outside the buffers (very low risk zone)

Beyond the 10km buffer described above in Section 2.2.1, identification of areas for strategic development generally carries a very low risk of having LSE. In other words, unless there are identified exceptional impact pathways (see 2.3 below), strategic development in this zone should not require detailed analysis during the HRA process. This very low risk zone has been mapped using green shading (in keeping with a 'traffic-light' approach to colour-coding of risk areas).

2.3 Exceptional impact pathways

For this exercise, at this stage, we have not included a conclusive assessment of exceptional pathways (those beyond 10km from a European site). That is not to say that they could not operate for certain European sites; rather, that to determine whether they do would require significant effort and detail which is beyond the scope of this early pre-screening exercise. At this stage, we have included all European sites within 20km of the Oxfordshire area. Any strategic development and policies proposed within the 10-20km zone would be subject to careful consideration at HRA Stage 1 Screening and, if LSE were identified, at Stage 2 Appropriate Assessment. Examples of potential exceptional pathways would be air pollution arising along major transport routes and from large combustion plants, downstream water impacts of pollution and non-native species transfer and whole catchment impacts to migratory/highly mobile qualifying fish species.

In particular, for air quality impacts from vehicle traffic, the risk of LSE will relate to the distance of designated sites from roads where development is likely to significantly increase traffic volume. The normal screening distance for air quality impacts has generally been 200m between the road and European site (although recent Ricardo modelling has shown up to 500m may be appropriate). However, a development could potentially generate significant increases in traffic flows in close proximity to a European site which is many kilometres away. Therefore, major roads are likely to be exceptional impact pathways from developments to European Sites, which will need to be examined once traffic modelling is available at the HRA screening stage.

Recent consultation with Natural England indicated that examples of sites which fall within 200m of major roads include Oxford Meadows SAC, Aston Rowant SAC and Chiltern Beechwoods SAC. Natural England has also highlighted Burnham Beeches SAC as being susceptible to air quality impacts from distant sources.

2.4 Limitations and assumptions

This exercise was designed to help inform scenario development for the Oxfordshire Plan from an HRA perspective. If the buffer zones included are avoided when developing scenarios then the chance of LSE will be greatly reduced but not necessarily removed. Conversely, if scenarios are located within the buffer zones it is not necessarily the case that there will be a LSE or future adverse effect on site integrity; just that the likelihood of that happening is increased.

The buffer zones applied are typically precautionary in nature and should therefore not be the sole reason for not advocating development in certain areas. Local knowledge held by the team developing the Plan should also be brought to bear in such instances. For example, the buffer zones applied are simple concentric rings around the boundary of each European site – they do not take into account local conditions, land use, potential barriers such as roads or railways or other factors which could determine whether or not a development scenario would have LSE. Whilst we have made reasonable endeavours to identify suitable and robust distance thresholds for the inner buffer based on existing information, we have not undertaken a comprehensive literature review to determine these, nor conducted bespoke studies, as that level of detail is beyond the scope of this exercise (and will be undertaken as required in later stages of the HRA of the Oxfordshire Plan as it emerges).

3 Results

The results of this distance-based pre-screening exercise to inform the Oxfordshire Plan scenario development are shown in **Appendix 1** (precautionary 10km buffer and inner buffer). For visual impact and simplicity, we have used the following traffic light system:

- **ORANGE** Higher risk of LSE if development occurs within this zone.
- **YELLOW** Lower risk of LSE if development occurs within this zone.
- **GREEN** Very low risk of LSE if development occurs within this zone.

Given that the intended purpose of the maps is to inform the development of the Oxfordshire Plan 2050 (see Section 1), no interpretation of the results is given here.

4 Next steps

Now that this initial distance-based pre-screening exercise has been completed, it can be used by the Oxfordshire Plan 2050 team to further develop their spatial scenarios and prepare their draft Plan for formal HRA consideration in due course.

It may be useful to seek Natural England's views on this report before using it for spatial planning.

After a draft Oxfordshire Plan 2050 has been prepared, subsequent stages of the HRA process will be undertaken. The Stage 1 screening assessment will consider and assess impacts arising from the Oxfordshire Plan 2050, both alone and in combination with other plans and projects. In combination impacts are likely to include air quality impacts arising from increased vehicle traffic associated with the strategic plans developed by neighbouring local authorities. A search for relevant plans and projects to consider for the in-combination assessment will be carried out during the Stage 1 screening assessment. Any LSE that are identified during the Stage 1 screening assessment will be carried forward for further consideration in a Stage 2 appropriate assessment.

Appendices

Appendix 1 – Oxfordshire HRA Risk-zones



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