

# Report to Inform Habitats Regulations Assessment of the Fairford Neighbourhood Plan

Fairford Town Council

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## Quality information

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# 1. Introduction

## Scope of project

- 1.1 AECOM was appointed by Fairford Town Council to undertake a Report to Inform the Habitats Regulations Assessment (HRA) of the Fairford Neighbourhood Plan (NP). This is to inform the client and Cotswold District Council (CDC) of the potential effects of NP development on European Sites and how they are being, or should be, addressed in the draft plan document. The NP is a statutory document that will be incorporated into the Local Planning Framework and is to be used by CDC to determine the outcome of planning applications. While NPs must adhere to higher-level planning policy at the level of local authorities, they are designed to enable local communities to help shape their own future development.
- 1.2 As 'competent authority', the legal responsibility for ensuring that a decision of 'likely significant effects' is made, for ensuring an 'appropriate assessment' (where required) is undertaken, and for ensuring Natural England are consulted, falls on the local planning authority. However, they are entitled to request from the Qualifying Body the necessary information on which to base their judgment and that is a key purpose of this report.
- 1.3 Development in the geographic area covered by the Fairford NP is also set out in the Cotswold District Local Plan (CDLP, adopted August 2018). The CDLP covers the period between 2011 to 2031 and set an indicative number of 61 homes to be built in Fairford. The Fairford NP covers the same period and establishes its own development quantum in Policy FNP14 (A New Low Carbon Community in Fairford) of around 80 homes.
- 1.4 The primary aim of the Fairford NP is to develop a sustainable future for the area, which must address several issues. Fairford is a Cotswold market town in south-east Gloucestershire and borders the Cotswold Area of Outstanding National Beauty (AONB). The River Coln runs through the neighbourhood plan area on a north-south axis before meeting the R. Thames at Lechlade. The R. Thames itself flows adjacent to the North Meadow & Clattinger Farm SAC, resulting in seasonal flooding of the meadows. Fairford town comprises several retail and accommodation facilities (e.g. pubs, shops and community facilities). The vision for the Fairford NP is to provide the required level of housing need, while acknowledging its environmental impacts. The Fairford NP provides policies that cover all aspects of development, including detail on infrastructure provision and nature conservation. The NP is explicitly in adherence with the overarching CDLP and its HRA. Therefore, due regard will be given to that HRA in all relevant sections of this report.
- 1.5 The CDLP was subject to HRA in April 2017, which covered a wide range of impact pathways in relation to growth delivered across the authority, including effects on the water table, toxic contamination and non-physical disturbance. For example, the HRA undertook Appropriate Assessment of potential recreational pressure effects in the North Meadow & Clattinger Farm SAC, identifying that its lowland hay meadows are vulnerable to impacts from recreation. The CDLP HRA assessed a much larger quantum of housing growth (8,400 dwellings across Cotswold District) and is therefore a useful starting point for assessing the impact pathway recreational pressure in the context of the Fairford NP.
- 1.6 An HRA is required under the terms of the Conservation of Habitats & Species Regulations 2017 (as amended). It assesses if any NP policies or site allocations have the potential to cause Likely Significant Effects or adverse effects on the integrity of European Sites (Special Areas of Conservation, SACs; Special Protection Areas, SPAs; and Ramsar sites, designated under the Ramsar convention), either alone or 'in combination' with other plans and projects, and to determine whether policy- or site-specific mitigation measures are required.

## Legislation

- 1.7 The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). This established a transition period, which ended on 31 December 2020. The Withdrawal Act retains the body of existing EU-derived law within our domestic law and this continues to apply in the UK.

- 1.8 The need for HRA is set out within the Conservation of Habitats & Species Regulations 2017 (as amended) and concerns the protection of European sites (Figure 1). European sites can be defined as actual or proposed/candidate Special Areas of Conservation (SAC) or Special Protection Areas (SPA). It is also Government policy for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to Natura 2000 sites.
- 1.9 The HRA process applies the precautionary principle to protected areas. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

**Conservation of Habitats and Species Regulations 2017 (as amended)**

With specific reference to Neighbourhood Plans, Regulation 106(1) states that:

*“A qualifying body which submits a proposal for a neighbourhood development plan must provide such information as the competent authority [the Local Planning Authority] may reasonably require for the purpose of the assessment under regulation 105... [which sets out the formal process for determination of ‘likely significant effects’ and the appropriate assessment].”*

**Figure 1: The legislative basis for HRA**

- 1.10 It is therefore important to note that this report has two purposes:
- To assist the Qualifying Body (Fairford Town Council) in preparing their plan by recommending (where necessary) any adjustments required to protect European sites, thus making it more likely their plan will be deemed compliant with the Conservation of Habitats and Species Regulations 2017 (as amended); and
  - On behalf of the Qualifying Body, to assist the Local Planning Authority (Cotswold District Council) to discharge their duty under Regulation 105 (in their role as ‘plan-making authority’ within the meaning of that regulation) and Regulation 106 (in their role as ‘competent authority’).
- 1.11 Over the years, ‘Habitats Regulations Assessment’ (HRA) has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of “Appropriate Assessment”. Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

## 2. Methodology

### Introduction

- 2.1 Figure 2 below outlines the stages of HRA according to current Ministry of Housing, Communities and Local Government guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the Plan until no significant adverse effects remain.

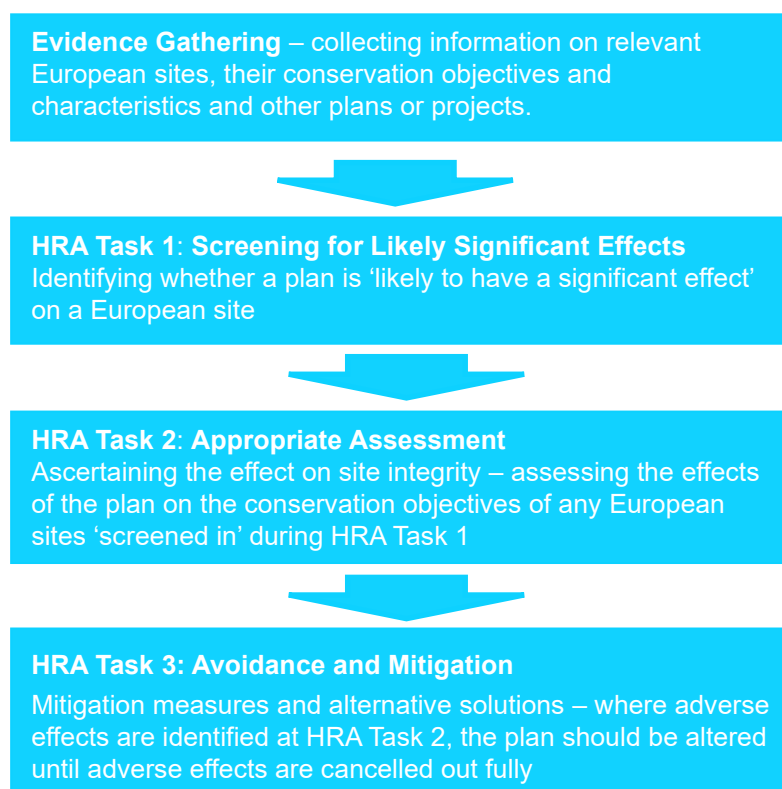


Figure 2: Four Stage Approach to Habitats Regulations Assessment. Source GOV.UK, 2019.

### HRA Task 1 – Likely Significant Effects (LSE)

- 2.2 Following evidence gathering, the first stage of any Habitats Regulations Assessment (and thus of this Report to Inform Cotswold District Councils HRA) is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

*"Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"*

- 2.3 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites. This stage of the Report to Inform HRA is undertaken in Chapter 5 of this report.

### HRA Task 2 – Appropriate Assessment (AA)

- 2.4 Where it is determined that a conclusion of 'no likely significant effect' cannot be drawn in the view of the report authors, the analysis in this Report to Inform HRA has proceeded to the next stage known as Appropriate Assessment. Case law has clarified that 'appropriate assessment' is



not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment rather than determination of likely significant effects.

- 2.5 During July 2019 the Ministry of Housing, Communities and Local Government published guidance for Appropriate assessment<sup>1</sup>. Paragraph: 001 Reference ID: 65-001-20190722m explains: *'Where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site's conservation objectives. The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured'*.
- 2.6 As this analysis follows on from the screening process, there is a clear implication that the analysis will be more detailed than undertaken at the Screening stage and one of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the appropriate assessment takes any policies or allocations that could not be dismissed following the high-level screening analysis and analyses the potential for an effect in more detail, with a view to concluding whether there would be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the European site(s)).
- 2.7 A decision by the European Court of Justice<sup>2</sup> concluded that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may no longer be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. The UK is no longer part of the European Union. However, as a precaution, it is assumed for the purposes of this HRA that EU case law regarding Habitat Regulations Assessment will still be considered informative jurisprudence by the UK courts. That ruling has therefore been considered in producing this Report to Inform HRA.
- 2.8 Also, in 2018 the Holohan ruling<sup>3</sup> was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that *'As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, ... typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area'* [emphasis added]. However, the North Meadow & Clattinger Farm SAC is not designated for mobile species that would use functionally linked habitats beyond the designated site boundary.

## HRA Task 3 – Avoidance and Mitigation

- 2.9 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on European sites subject to the agreement of Cotswold District Council as competent authority. There is considerable precedent concerning the level of detail that a Neighbourhood Plan document needs to contain regarding mitigation for recreational impacts on European sites. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the Plan, but the Plan must provide an adequate policy framework within which these measures can be delivered.
- 2.10 In evaluating significance, AECOM has relied on professional judgement and the LP HRA regarding development impacts on the European sites considered within this assessment.
- 2.11 When discussing 'mitigation' for a Neighbourhood Plan document, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves since such planning documents are high-level policy documents. A Neighbourhood Plan is a lower level constituent of a Local Development Plan.

<sup>1</sup> <https://www.gov.uk/guidance/appropriate-assessment#what-are-the-implications-of-the-people-over-wind-judgment-for-habitats-regulations-assessments> [Accessed: 07/01/2020].

<sup>2</sup> People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

<sup>3</sup> Case C-461/17

## Confirming Other Plans and Projects That May Act 'In Combination'

- 2.12 It is a requirement of the Regulations that the impacts of any development plans are not only considered in isolation but in-combination with other plans and projects that may also be affecting the European site(s) in question. In combination effects have therefore been considered in this Report to Inform HRA.
- 2.13 For example, when considering the potential for combined regional housing development across multiple local authorities to impact on European sites, a key emphasis must be on the cumulative impact of visitor numbers (i.e. recreational pressure). While one parish might only contribute a minor portion of recreational pressure (with no or little negative impact on a European site), other adjacent parishes may also each contribute minor 'amounts' of recreation. Cumulatively, especially across multiple authorities, this could result in detectable disturbance effects on designated species.
- 2.14 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e. to ensure that those projects or plans (which in themselves may have minor impacts) are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in-combination assessment is therefore of greatest relevance when the plan or policy would otherwise be screened out because its individual contribution is negligible.

## 3. European Sites

### North Meadow and Clattinger Farm SAC

#### Introduction

- 3.1 The North Meadow and Clattinger Farm SAC is a 105.23ha large site that is situated in south-west England, comprising humid grassland (71%), dry grassland (15%), improved grassland (12%) and inland waterbodies (2%). The qualifying habitat is lowland hay meadows, representing one of two sites near the centre of its UK range. The site exhibits exceptional survival of traditional hay meadow management with high degree of conservation of structure and function. The SAC supports over 90% of the extant UK population of fritillary *Fritillaria meleagris*, which is a characteristic but rare species of damp lowland meadows.
- 3.2 Both parts of the SAC lie within the Cotswold Water Park, a manmade wetland created by the restoration of sand and gravel pits. The site sits within the floodplain of the River Thames and experiences great seasonal variation in water levels, giving rise to its characteristic flora. In recent years, both component SSSIs of the SAC have experienced prolonged flooding periods, threatening future hay meadow management. The SAC is also a National Nature Reserve that experiences high visitor levels and management is in place to protect its fritillary population.

#### Qualifying Features<sup>4</sup>

- 3.3 Annex I habitats that are a primary reason for selection of this site:
- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)

#### Conservation Objectives<sup>5</sup>

- 3.4 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;
- 3.5 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

#### Threats / Pressures to Site Integrity<sup>6</sup>

- 3.6 The following threats and pressures to the integrity of the North Meadow and Clattinger Farm SAC have been identified in Natural England's Site Improvement Plan:
- Inappropriate water levels
  - Habitat fragmentation
  - Commons management
  - Public access / disturbance
  - Water pollution

<sup>4</sup> <https://sac.incc.gov.uk/site/UK0016372> [Accessed on the 16/04/2021]

<sup>5</sup> <http://publications.naturalengland.org.uk/publication/6299293463871488> [Accessed on the 16/04/2021]

<sup>6</sup> <http://publications.naturalengland.org.uk/publication/4565167836758016> [Accessed on the 16/04/2021]

- 3.7 Reference to the Supplementary Advice on the Conservation Objectives<sup>7</sup> underlines the importance of inappropriate water levels and water pollution. It states that *'For this Annex 1 feature, the deposition of nutrients, particularly phosphate ('P'), as sediment in floodwaters have the potential to impact the site, Further site-specific investigation on the site's nutrient budget/balance is required to establish more precise water quality standards for the SAC'* and that *'A series of summer floods at North Meadow have caused a decline in the area of MG4 grassland, which corresponds to H6510, since an extensive survey carried out in 1995 and 1996. The consequences of recent floods at North Meadow e.g. elevated phosphorous levels in the soil are still in evidence and will be exacerbated by potential further flooding in the future. Excessive and unseasonal flooding presents the most significant risk to the H6510 feature at North Meadow'*. The advice references air quality and the fact that nitrogen and ammonia are below their critical loads or levels but that the habitat is considered vulnerable to atmospheric pollution. It also underlines the importance of the precise management regime in maintaining the botanical structure and diversity of the sward stating that *'The H6510 feature is the product of longterm management of both sites as lowland hay meadows with a late summer hay cut followed by aftermath grazing. This continued management is essential to the maintenance of the qualifying feature'*.

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<sup>7</sup> <http://publications.naturalengland.org.uk/publication/6299293463871488>

## 4. Impact Pathways

### Recreational Pressure

4.1 There is concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfil conservation objectives while also providing recreational opportunity. Various research reports have provided compelling links between changes in housing and access levels and impacts on European protected sites<sup>8 9</sup>. This applies to any habitat, but the additional recreational pressure from housing growth on destinations designated for bird species can be especially strong and some qualifying species are known to be susceptible to disturbance. Studies across a range of species have shown that the effects from recreation can be complex. HRAs of planning documents tend to focus on recreational sources of disturbance as a result of new residents<sup>10</sup>.

### Trampling Damage, Nutrient Enrichment and Substrate Disturbance

4.2 Most terrestrial habitats (including grassland, heathland, dune habitat and woodland) can be affected by trampling and other mechanical damage, which in turn dislodges or damages individual plants and leads to soil compaction and erosion. The following studies have assessed the impact of trampling associated with recreational activities in different habitats:

- Wilson & Seney<sup>11</sup> examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
- Cole et al<sup>12</sup> conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each trampled between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. The cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of regular disturbance cycles.

<sup>8</sup> Liley D, Clarke R.T., Mallord J.W., Bullock J.M. 2006a. The effect of urban development and human disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. *Natural England / Footprint Ecology*.

<sup>9</sup> Liley D., Clarke R.T., Underhill-Day J., Tyldesley D.T. 2006b. Evidence to support the appropriate Assessment of development plans and projects in south-east Dorset. *Footprint Ecology / Dorset County Council*.

<sup>10</sup> The RTPI report 'Planning for an Ageing Population'(2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.

<sup>11</sup> 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

<sup>12</sup> Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* **32**: 203-214

Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* **32**: 215-224

- Cole<sup>13</sup> conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampling weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier trampers caused a greater reduction in vegetation height than lighter trampers, but there was no difference in the effect on cover.
- Cole & Spildie<sup>14</sup> experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse trampling was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance but recovered rapidly. Generally, it was shown that higher trampling intensities caused more disturbance.
- In heathland sites, trampling damage can affect the value of a site to wildlife. For example, heavy use of sandy tracks loosens and continuously disturbs sand particles, reducing the habitat's suitability for invertebrates<sup>15</sup>. Species that burrow into flat surfaces such as the centres of paths, are likely to be particularly vulnerable, as the loose sediment can no longer maintain their burrow. In some instances, nature conservation bodies and local authorities resort to hardening paths to prevent further erosion. However, this is concomitant with the loss of habitat used by wildlife, such as sand lizards and burrowing invertebrates.

4.3 Prolonged or repeated excessive trampling and erosion may, over time, lead to soil compaction, widening of paths / trails and damage to individual plants and their roots. For example, it has been demonstrated that recreational trails with high usage are subject to significantly more erosion and root exposure<sup>16</sup>. Soil compaction leads to a loss of space for air and water molecules, both of which are integral to plant health, due to processes such as nutrient uptake and hydration<sup>17</sup>. Due to their high ecological value, this can be a particular issue for lowland hay meadows and associated rare fritillaries.

4.4 A major concern for many habitats is nutrient enrichment associated with dog fouling, which has been addressed in various reviews (e.g.<sup>18</sup>). It is estimated that dogs will defecate within 10 minutes of starting a walk and therefore most nutrient enrichment arising from dog faeces will occur within 400m of a site entrance. In contrast, dogs will urinate at frequent intervals during a walk, resulting in a more spread out distribution of urine. For example, in Burnham Beeches National Nature Reserve it is estimated that 30,000 litres of urine and 60 tonnes of dog faeces are deposited annually<sup>19</sup>. While there is little information on the chemical constituents of dog faeces, nitrogen is one of the main components<sup>20</sup>. Nutrient levels are one of the major determinants of plant community composition and the effect of dog defecation in sensitive habitats may be comparable to a high-level application of fertiliser, potentially resulting in the shift to plant communities that are more typical for improved grasslands. While it is noted that the North Meadow & Clattinger Farm SAC is a relatively nutrient-rich environment due to its seasonal flooding from the Thames, excessive additional nutrient input from dog faeces may exacerbate any effects of nutrient loading from treated sewage effluent.

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<sup>13</sup> Cole, D.N. 1995c. Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.

<sup>14</sup> Cole, D.N., Spildie, D.R. 1998. Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* **53**: 61-71

<sup>15</sup> Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

<sup>16</sup> Leung Y.-F. & Marion J. F. (2000). Recreation impacts and management in wilderness: A state-of-knowledge review. USDA Forest Service Proceedings 5: 23-48.

<sup>17</sup> Natural England Site Conservation Objectives Supplementary Advice Note for the Windsor Forest & Great Park SAC. Available at: <http://publications.naturalengland.org.uk/publication/5175000009015296> [Accessed on the 14/10/2019].

<sup>18</sup> Taylor K., Anderson P., Taylor R.P., Longden K. & Fisher P. 2005. Dogs, access and nature conservation. English Nature Research Report, Peterborough.

<sup>19</sup> Barnard A. 2003. Getting the facts – Dog walking and visitor number surveys at Burnham Beeches and their implications for the management process. *Countryside Recreation* 11:16-19.

<sup>20</sup> Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

## Typical Mitigation Measures

- 4.5 Mitigation measures to avoid recreational pressure effects usually involve a combination of access management, habitat management and provision of alternative recreational space. Access management (restricting access to some or all of a European site) is not typically within the remit of Town and Parish Councils and restriction of access may contravene a range of Government policies on access to open space and objectives for increasing exercise, improving health etc. However, active management of access may be possible, such as that practised on nature reserves. Habitat management also does not lie within the direct remit of Town and Parish Councils. However, the Councils can help to set a framework for improved habitat management by promoting collaboration with neighbouring Parishes and Local Planning Authorities. For example, provision of alternative recreational space can help to attract recreational users away from sensitive European Sites and reduce recreational pressure effects. However, the location and type of alternative space must be carefully tailored to site users for this to be effective.

## Summary

- 4.6 Overall, the following European Site within 10km of Fairford neighbourhood plan area is sensitive to recreational pressure as a result of NP development (the site in bold is taken forward into the following chapters):
- **North Meadow & Clattinger Farm SAC (located approx. 5.5km to the south-west of Fairford Neighbourhood Plan area)**

## Water Quality

- 4.7 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:
- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
  - Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing bioavailable nitrogen.
  - Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.
- 4.8 The most significant issue in relation to the Fairford NP is the discharge of treated sewage effluent, which is likely to increase nutrient concentrations in local watercourses such as the River Thames. Phosphate is the main limiting nutrient in freshwater ecosystems and is likely to cause eutrophication if it increases significantly. The North Meadow & Clattinger Farm SAC is designated for lowland hay meadows and while this habitat depends on nutrient input from seasonal flooding events, a significant increase in the nutrient loading of the R. Thames may lead to changes in the plant community composition of the SAC. The Site Improvement Plan (SIP) for the SAC<sup>21</sup> highlights water pollution as a threat to the site. For example, it states that increased nutrient levels could lead to soil enrichment, with potential negative impacts on the species richness of the meadows.
- 4.9 The NP assessed in this Report to Inform HRA provides for development in the geographic area covered by Thames Water, responsible for the public water supply and wastewater treatment

<sup>21</sup> Available at: <http://publications.naturalengland.org.uk/publication/6283453993582592> [Accessed on the 26/03/2021]

within this part of Cotswolds District. The potential implications of this development are outlined in Table 1.

**Table 1: Wastewater Treatment Works (WwTWs) serving development allocated in Fairford with potential hydrological continuity with the North Meadow & Clattinger Farm SAC.**

WwTW Catchment	Residential development quantum allocated in the Fairford Neighbourhood Plan	HRA implications
Fairford WwTW (operated by Thames Water and located in the adjoining Kempsford parish)	Up to 80 dwellings	Discharge of treated sewage effluent into local watercourses, such as the River Thames. This is hydrologically connected to the North Meadow & Clattinger Farm SAC and could lead to water quality changes during the wet season.

4.10 Overall, the following European Site within 10km of Fairford neighbourhood plan area s sensitive to changes in water quality as a result of NP development (the site in bold is taken forward into the following chapters):

- **North Meadow & Clattinger Farm SAC (located approx. 5.5km to the south-west of Fairford Neighbourhood Plan Area)**

## Water Quantity, Level and Flow

4.11 The water level, its flow rates and the mixing conditions are important determinants of the condition of European Sites and their qualifying features. Hydrological processes are critical in influencing habitat characteristics in freshwater habitats, including supplied water volume, water level, water temperature and dissolved oxygen concentrations. In turn these parameters determine the short- and long-term viability of plant and animal species, as well as overall ecosystem composition.

4.12 A highly cited review paper summarises the ecological effects of reduced flow in rivers. Droughts (ranging in their magnitude from flow reduction to a complete loss of surface water) have both direct and indirect effects on river communities and connected habitats. For example, a marked direct effect is the loss of water and habitat for aquatic species. Indirect effects include a deterioration in water quality, changes to nutrient concentrations and alterations in community composition.

4.13 There are two mechanisms through which urban development might negatively affect the water level in water-dependent SACs:

- The supply of new housing with potable water may require an increase in the abstraction of water from surface water and groundwater bodies. Depending on the level of water stress in the geographic region, this is likely to reduce the water level in SACs sharing the same catchment.
- The expansion of impermeable surfaces in urban areas increases the volume and speed of surface water runoff. As traditional drainage systems often cannot cope with the volume of stormwater, sewer overflows are designed to discharge excess water directly into watercourses. Often this pluvial flooding results in excessive downstream inundation of watercourses and the potential flooding of wetland habitats.

4.14 The North Meadow & Clattinger Farm SAC is designated for lowland hay meadows, which are sensitive to changes in water level. The primary mechanism by which the Fairford NP could affect this would be via a change in the volume of freshwater supplied by the River Thames – most likely a reduction in freshwater input due to water abstraction for the water supply of new residential development. For example, Natural England’s Site Improvement highlights inappropriate water levels as the primary pressure / threat to the integrity of the SAC, leading to potential changes in the community composition of the sward.



- 4.15 Generally, waterbodies within and downstream of urban areas are likely to have only limited capacity to take up some of the surface- water runoff from pavement and buildings. If this capacity is exceeded and there is excessive freshwater input from impermeable surfaces, this may result in exacerbated flooding of designated sites in hydrological connectivity with affected surface waterbodies. The SIP establishes that more frequent and prolonged flooding events are causing changes to the vegetation communities in the SAC. However, in the case of the Fairford NP, direct water surface runoff is unlikely to be an issue, given that the North Meadow & Clattinger Farm SAC lies at a distance of approx. 5.5km from the neighbourhood plan area.
- 4.16 The following European Site within 10km of Fairford neighbourhood plan area is sensitive to changes in the water quantity, level and flow as a result of NP development (the site in bold is taken forward into the following chapters):
- **North Meadow & Clattinger Farm SAC (located approx. 5.5km to the south-west of Fairford Neighbourhood Plan Area)**

## Atmospheric Pollution (through Nitrogen Deposition)

- 4.17 The main pollutants of concern for European sites are oxides of nitrogen (NO<sub>x</sub>), ammonia (NH<sub>3</sub>) and sulphur dioxide (SO<sub>2</sub>) and are summarised in Table 2. Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges<sup>22</sup>. NO<sub>x</sub> can also be toxic at very high concentrations (far above the annual average critical level). However, in particular, high levels of NO<sub>x</sub> and NH<sub>3</sub> are likely to increase the total N deposition to soils, potentially leading to deleterious knock-on effects in resident ecosystems. Increases in nitrogen deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on the community composition and quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats<sup>23 24</sup>.

**Table 2: Main sources and effects of air pollutants on habitats and species<sup>25</sup>**

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO <sub>2</sub> )	<p>The main sources of SO<sub>2</sub> are electricity generation, and industrial and domestic fuel combustion. However, total SO<sub>2</sub> emissions in the UK have decreased substantially since the 1980's.</p> <p>Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO<sub>2</sub> have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO<sub>2</sub> emissions in the UK.</p>	<p>Wet and dry deposition of SO<sub>2</sub> acidifies soils and freshwater and may alter the composition of plant and animal communities.</p> <p>The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species.</p> <p>However, SO<sub>2</sub> background levels have fallen considerably since the 1970's and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.</p>
Acid deposition	<p>Leads to acidification of soils and freshwater via atmospheric deposition of SO<sub>2</sub>, NO<sub>x</sub>, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels.</p> <p>Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will</p>	<p>Gaseous precursors (e.g. SO<sub>2</sub>) can cause direct damage to sensitive vegetation, such as lichen, upon deposition.</p> <p>Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis,</p>

<sup>22</sup> [http://www.apis.ac.uk/overview/pollutants/overview\\_NOx.htm](http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm), accessed 01/04/2020.

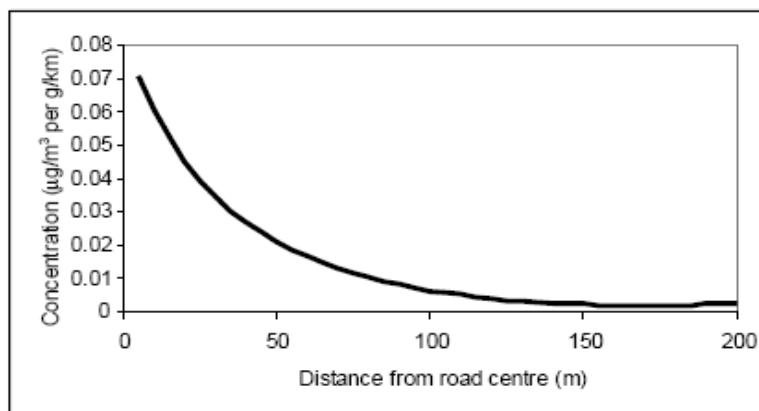
<sup>23</sup> Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. **2006**. Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. *Lichenologist* 38: 161-176

<sup>24</sup> Dijk, N. **2011**. Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: evidence from a long-term field manipulation *Global Change Biology* 17: 3589-3607

<sup>25</sup> Information summarised from the Air Pollution Information System (<http://www.apis.ac.uk/>)

Pollutant	Source	Effects on habitats and species
	<p>continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.</p>	<p>reduced decomposition rates, and compromised reproduction in birds / plants.</p> <p>Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.</p>
Ammonia (NH <sub>3</sub> )	<p>Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock.</p> <p>Ammonia reacts with acid pollutants such as the products of SO<sub>2</sub> and NO<sub>x</sub> emissions to produce fine ammonium (NH<sub>4</sub><sup>+</sup>) - containing aerosol. Due to its significantly longer lifetime, NH<sub>4</sub><sup>+</sup> may be transferred much longer distances (and can therefore be a significant trans-boundary issue).</p> <p>While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.</p>	<p>The negative effect of NH<sub>4</sub><sup>+</sup> may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation.</p> <p>Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen.</p> <p>As emissions mostly occur at ground level in the rural environment and NH<sub>3</sub> is rapidly deposited, some of the most acute problems of NH<sub>3</sub> deposition are for small relict nature reserves located in intensive agricultural landscapes.</p>
Nitrogen oxides (NO <sub>x</sub> )	<p>Nitrogen oxides are mostly produced in combustion processes. Half of NO<sub>x</sub> emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes.</p> <p>In contrast to the steep decline in Sulphur dioxide emissions, nitrogen oxides are falling slowly due to control strategies being offset by increasing numbers of vehicles.</p>	<p>Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NO<sub>x</sub> for all vegetation types has been set to 30 ug/m<sup>3</sup>.</p> <p>Deposition of nitrogen compounds (nitrates (NO<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>) and nitric acid (HNO<sub>3</sub>)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification.</p> <p>In addition, NO<sub>x</sub> contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.</p>
Nitrogen deposition	<p>The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO<sub>x</sub>) or reduced (e.g. NH<sub>3</sub>) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices.</p> <p>The N pollutants together are a large contributor to acidification (see above).</p>	<p>All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally.</p> <p>Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species.</p> <p>N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.</p>
Ozone (O <sub>3</sub> )	<p>A secondary pollutant generated by photochemical reactions involving NO<sub>x</sub>, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above).</p> <p>Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when</p>	<p>Concentrations of O<sub>3</sub> above 40 ppb can be toxic to both humans and wildlife, and can affect buildings.</p> <p>High O<sub>3</sub> concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production</p>

Pollutant	Source	Effects on habitats and species
	ozone levels rise above 40ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	and altered species composition in semi-natural plant communities.
4.18	Sulphur dioxide emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as (particularly on a local scale) shipping <sup>26</sup> . Ammonia emissions originate from agricultural practices <sup>27</sup> , with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO <sub>2</sub> or NH <sub>3</sub> emissions will be associated with the Fairford NP.	
4.19	NOx emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). A 'typical' housing development will contribute by far the largest portion to its overall NOx footprint (92%) through the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison <sup>28</sup> . Emissions of NOx could therefore be reasonably expected to increase because of a higher number of vehicles due to implementation of the Fairford NP.	
4.20	According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 µgm <sup>-3</sup> ; the threshold for sulphur dioxide is 20 µgm <sup>-3</sup> . In addition, ecological studies have determined 'critical loads' <sup>29</sup> of atmospheric nitrogen deposition (that is, NOx combined with ammonia NH <sub>3</sub> ).	
4.21	The Department of Transport's Transport Analysis Guidance stipulates that, beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant <sup>30</sup> (Figure 3). This is therefore the distance that has been used throughout this Report to Inform HRA in order to determine whether the North Meadow & Clattinger Farm SAC is likely to be significantly affected by development outlined in the Fairford NP.	



**Figure 3: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT<sup>31</sup>)**

- 4.22 Exhaust emissions from vehicles are capable of adversely affecting most plants and their community composition. Considering this, an increase in the net local population associated with the Fairford NP could result in increased traffic alongside the North Meadow & Clattinger Farm SAC, if likely to be affected by commuter journeys from / to the Fairford NP area.
- 4.23 Air quality and European sites is an 'in combination' issue and therefore traffic growth across the whole of Cotswold District must be considered in context. Overall, the following European Site

<sup>26</sup> [http://www.apis.ac.uk/overview/pollutants/overview\\_SO2.htm](http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm).

<sup>27</sup> Pain, B.F.; Weerden, T.J.; Chambers, B.J.; Phillips, V.R.; Jarvis, S.C. 1998. A new inventory for ammonia emissions from U.K. agriculture. *Atmospheric Environment* 32: 309-313

<sup>28</sup> Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. <http://www.airquality.co.uk/archive/index.php>

<sup>29</sup> The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur.

<sup>30</sup> <http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013> [Accessed on the 01/04/2020]

<sup>31</sup> <http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf> [Accessed on the 01/04/2020]

lies within 10km (the average commuting distance of a UK resident) of Fairford NP area and is sensitive to atmospheric pollution (the site in bold is taken forward into the following chapters):

- **North Meadow & Clattinger Farm SAC (located approx. 5.5km to the south-west of Fairford Neighbourhood Plan area)**

## 5. Test of Likely Significant Effects

### Introduction

5.1 The initial scoping of impact pathways and the relevant European Site identified that the following require consideration:

#### **Recreational Pressure**

- North Meadow & Clattinger Farm SAC

#### **Water Quality**

- North Meadow & Clattinger Farm SAC

#### **Water Level**

- North Meadow & Clattinger Farm SAC

#### **Atmospheric Pollution**

- North Meadow & Clattinger Farm SAC

5.2 The policies contained within the Fairford NP are screened for their Likely Significant Effects (LSEs) on European Sites in Appendix A. Figure 4 below shows Fairford NP area in relation to the North Meadow & Clattinger Farm SAC, the only European Site within 10km of the Neighbourhood Plan area.

**Figure 4: The Fairford NP area in relation to the North Meadow & Clattinger Farm SAC, the only European Site within 10km of the Neighbourhood Plan Area. The residential community allocated in the NP is also displayed.**

## Recreational Pressure

5.3 The overall amount of residential growth to be delivered in Fairford equates to 80 dwellings. The following policies in the NP have the potential to result LSEs regarding the impact pathway recreational pressure:

- **Policy FNP7 – Improving Access to Visitor Attractions** (improves pedestrian and cycle access to key visitor attractions, such as Cotswold Water Park and the Thames Path; these measures may also lead to an increase in the volume of visitors to the North Meadow & Clattinger Farm SAC)
- **Policy FNP14 – A new Low Carbon Community in Fairford** (provides for 80 dwellings in Fairford)
- **Policy FNP18 – New Visitor Accommodation** (supports potential new visitor accommodation in Fairford)

## North Meadow & Clattinger Farm SAC

5.4 The residential development outlined in the Fairford NP allocates up to 80 dwellings, which will result in a net increase of recreational visits to nearby outdoor areas, including both recreational greenspaces and designated sites. The distances that local residents travel to undertake recreational activities are likely to vary greatly and depend on the type of activity undertaken. For example, dog walkers often tend to undertake frequent and short walks near their home, whereas people on family outings or wildlife watchers are likely to travel further and spend more time at their destinations. This is partly because the desired features of interest (e.g. specific sceneries or wildlife attractions) are limited to relatively few locations.

5.5 The primary method to assess the 'draw' of a European Site is to establish its core recreational catchment, which is based on the 75<sup>th</sup> percentile of the distances travelled by visitors using postcode data. While the catchment of most inland European Sites equates to roughly 5km, many sites with particular attractions may have much larger Zones of Influence (Zols). Sometimes Zols may change seasonally, for example due to the annual flowering of plants. Fairford lies approx. 5.5km from the North Meadow & Clattinger Farm SAC and thus towards the outer edge of typical Zols for inland sites.

5.6 The SAC is designated for lowland hay meadows (including the rare fritillaries), which are sensitive to trampling damage resulting from recreational activities, particularly where visitors venture off waymarked paths. Furthermore, during the wet season the ground is sensitive to soil compaction, potentially changing the soil conditions for vulnerable seedlings. Nutrient enrichment arising from dog fouling may influence sward composition by favouring more competitive grass species, potentially resulting in a decline in species diversity. Natural England's SIP mentions recreational pressure as a threat / pressure to the SAC, stating that current visitor levels are exceeding site capacity.

5.7 Overall, due to the sensitivity of the North Meadow & Clattinger Farm SAC to recreational pressure, Likely Significant Effects cannot be excluded in the opinion of the report authors, and the site is screened in for Appropriate Assessment.

## Water Quality

### North Meadow & Clattinger Farm SAC

5.8 The overall amount of residential growth to be delivered in Fairford equates to 80 dwellings. The following policies in the NP have the potential to result LSEs regarding the impact pathway water quality:

- **Policy FNP14 – A new Low Carbon Community in Fairford** (provides for 80 dwellings in Fairford)

- **Policy FNP18 – New Visitor Accommodation** (supports potential new visitor accommodation in Fairford)
- 5.9 The North Meadow & Clattinger Farm SAC is designated for lowland hay meadows, which typically lie on river and tributary floodplains. These meadows rely on seasonal flooding for the input of nutrients and are therefore sensitive to negative changes in water quality. NE's Site Improvement Plan highlights water pollution as a threat to the SAC, primarily as a result of flood water carrying diffuse pollutants onto the water meadows and potentially causing nutrient enrichment and a decline in species diversity. While WwTWs are not specifically mentioned as a concern, treated sewage effluent may significantly contribute to the overall nutrient loading in the SAC.
- 5.10 A review of mapping on MAGIC indicates that Fairford WwTW (located in the adjoining Kempford parish) will process the sewage produced by the 80 dwellings allocated in Fairford. This WwTW discharges into a drain that joins the River Coln. The R. Coln is a tributary to the R. Thames, with the confluence at Inglesham, approx. 17.2km downstream from the North Meadow & Clattinger Farm SAC. Therefore, while the R. Thames seasonally floods the SAC, there is no connecting pathway between treated sewage effluent (and nutrients) from Fairford and the qualifying lowland hay meadows. Overall, this impact pathway is screened out from Appropriate Assessment.

## Water Quantity, Level and Flow

### North Meadow & Clattinger Farm SAC

- 5.11 The overall amount of residential growth to be delivered in Fairford equates to 80 dwellings. The following policies in the NP have the potential to result LSEs regarding the impact pathway water quality:
- **Policy FNP14 – A new Low Carbon Community in Fairford** (provides for 80 dwellings in Fairford)
  - **Policy FNP18 – New Visitor Accommodation** (supports potential new visitor accommodation in Fairford)
- 5.12 The North Meadow & Clattinger Farm SAC is designated for lowland hay meadows, which depend on adequate water levels for the seasonal replenishment of nutrients. NE's Site Improvement Plan indicates that inappropriate water levels are the primary pressure / threat to the SAC. In recent years, more frequent flooding has led to changes in the botanical composition of the site and its boundaries. A Water Level Management Plan is needed to reduce impacts of increased flooding events.
- 5.13 Excessive changes in the water level of European Sites are most likely to be caused by increased abstraction rates for the potable water supply (potentially leading to a general reduction in water level / volume) and surface water run-off from impermeable surfaces (potentially leading to increased flooding and water levels). Due to the relatively long distance between Fairford Neighbourhood Plan Area and the North Meadow & Clattinger Farm SAC (approx. 5.5km), it is unlikely that increased surface runoff from developed brownfield sites would directly impact the volume of freshwater supplied to the site. Additionally, any flood water is most likely expected to contribute to the R. Thames downstream from the SAC and would thus not be affecting its water level.
- 5.14 However, while not specifically mentioned in the SIP, increased abstraction (particularly from streams or rivers) to supply water to new households in Fairford could lead to reduced freshwater input to the SAC, with potential concomitant decreases in nutrient concentrations. Due to the relatively small quantum of residential growth allocated in Fairford, this impact pathway is considered to be most relevant 'in-combination' with growth delivered across Cotswold District. Overall, Likely Significant Effects of the Fairford NP on the North Meadow & Clattinger Farm SAC regarding the impact pathway water quantity, level and flow, cannot be excluded in the opinion of the report authors. Therefore, the site is screened in for Appropriate Assessment.



## Atmospheric Pollution

5.15 The overall amount of residential growth to be delivered in Fairford equates to 80 dwellings. The following policies in the NP have the potential to result LSEs regarding the impact pathway water quality:

- **Policy FNP14 – A new Low Carbon Community in Fairford** (provides for 80 dwellings in Fairford)
- **Policy FNP18 – New Visitor Accommodation** (supports potential new visitor accommodation in Fairford)

5.16 The Fairford NP is a development plan that must be in compliance with the overarching Cotswold District Local Plan, adopted in August 2018. While the overall quantum of residential development allocated in Fairford is relatively small (a maximum of 80 dwellings), atmospheric pollution is an impact pathway where 'in combination' assessment is required.

## North Meadow & Clattinger Farm SAC

5.17 The North Meadow & Clattinger Farm SAC is designated for lowland hay meadows, which comprise grass swards of high biodiversity, including its population of rare fritillaries. The Air Pollution Information System (APIS) identifies this habitat feature as being sensitive to atmospheric nitrogen deposition with a nitrogen Critical Load of 20-30 kg N/ha/yr. A significant increase in nitrogen deposition may induce a fertilisation effect, resulting in an increase of tall grasses and a decrease of species diversity.

5.18 In 2018 Natural England published its guidance to local authorities on considering traffic related air quality impacts in HRA<sup>32</sup>. Having established that a sensitive site lies within 200m of a relevant road, that guidance then recommends mathematical screening criteria are applied to determine whether a likely significant effect will arise either from a plan/project alone, or from a plan/project in combination with other plans and projects. These criteria can be based on traffic flows (whether or not the plan/project will result in an increase of 1000 AADT on the road either alone or in combination with other plans and projects) or on the forecast change in pollution (whether or not the plan/project will result in an increase in pollution equivalent to 1% of the critical level or load at the SAC either alone or in combination with other plans and projects).

5.19 Expected traffic generation on the A419 within 200m of the SAC as a result of the allocation of 80 dwellings at Fairford has been modelled by the AECOM traffic team. Informed by 2011 Census data (WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)), the traffic associated with the proposed development has been distributed onto the surrounding local highway network. The majority of residents living in Fairford (MSOA Cotswold 009) commute within the Cotswolds, or to Swindon, West Oxfordshire and Wiltshire. Drivers will travel north of the SAC to reach the Cotswolds and West Oxfordshire whilst drivers travelling to Swindon and Wiltshire are likely to route through Meysey Hampton and Marston Meysey before joining the A419 south of the SAC.

5.20 Based on the likely origins / destinations mentioned above, it has therefore been modelled that the development of 80 dwellings at Fairford would result in 3-4 two-way AADT past the SAC (i.e. one to two vehicles making return journeys) and this is considered a precautionary estimate. Manual traffic count data accessed from The Department for Transport Road Traffic Statistics for 2019 identifies that the annual average daily two-way flow on the A419 400m south of the SAC (manual count point 27119, the nearest count location) is 42,566 AADT. A change in AADT of 3-4 AADT is therefore a change of 0.009% and well within the daily variation in traffic flows already seen on this stretch of highway. Clearly, the predicted flows due to the Neighbourhood Plan allocation will have a negligible effect on the SAC by themselves, but in accordance with Natural England guidance need discussing 'in combination' with other plans and projects. 'In combination' effects on the relevant section of the A419 were modelled in 2021 for the A417 Missing Link Development Consent Order<sup>33</sup>. Paragraphs 185 to 194 and Tables E-1 and F-1 of the associated Habitats Regulations Assessment Screening Report discuss the results. Table E-1 shows that

<sup>32</sup> <http://publications.naturalengland.org.uk/publication/4720542048845824>

<sup>33</sup> <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010056/TR010056-000618-6.5%20Environmental%20Statement%20-%20Habitats%20Regulations%20Assessment%20Screening%20Report.pdf>

the change in flows on the A419 within 200m of the SAC due to the Missing Link scheme alone would be 2,259 AADT by 2026. Therefore, there will be in an 'in combination' increase in traffic flows exceeding 1,000 AADT by 2031.

- 5.21 The report goes on to model the air quality implications of the forecast increase in traffic. The data in Table F-1 show that nitrogen deposition throughout the 200m modelled transect at the closest point of the road to the SAC (receptor locations EN1 to EN21) is below the minimum part of the critical load range (20 kgN/ha/yr) ranging from 19.1 kgN/ha/yr (at location EN21) to 19.5 kgN/ha/yr (at EN1, the closest part of the SAC to the road) and is forecast to remain below the critical load even when 'in combination' traffic growth is taken into consideration<sup>34</sup>. Comparison between Do Something and Baseline scenarios in Table F-1 also shows that the total 'in combination' effect from all forecast traffic growth to 2026 and the Missing Link scheme at the closest part of the SAC to the road is 0.1 kgN/ha/yr which equates to 0.5% of the lowest part of the critical load range (well below the 1% of the critical load threshold for dismissing pollution as mathematically imperceptible according to Natural England guidance). This is notwithstanding the fact that the contribution of the Missing Link scheme alone to traffic flows on the A419 will be a maximum of 2,259 AADT according to Table E-1 of the Missing Link HRA, far more than the 3-4 AADT that will be contributed through the allocation of 80 dwellings in the Fairford Neighbourhood Plan.
- 5.22 Ammonia and NOx concentrations in atmosphere were not specifically modelled for the Missing Link DCO but APIS indicates that concentrations throughout the SAC are below the critical levels of 3 µgm<sup>-3</sup> for ammonia and 3 µgm<sup>-3</sup> for NOx, being reported as a maximum 2.78 µgm<sup>-3</sup> for ammonia and 21.6 µgm<sup>-3</sup> for NOx.
- 5.23 Since traffic growth of several thousand AADT's has been calculated not to result in a nitrogen dose exceeding 1% of the critical load at the closest part of the SAC to the A419, the contribution of a further 3-4 AADT due to Fairford Neighbourhood Plan would be imperceptible in modelling results. This is particularly true since case law has also been clear that a plan or project can make a contribution to flows that is nonetheless too small to be of significance even in combination with other projects and plans:
- Advocate-General Sharpston's Opinion in European Court of Justice Case C-258/11 in Paragraph 48 specified that *'the requirement for an effect to be 'significant' exists in order to lay down a de minimis threshold. Plans and projects that have no appreciable effect on the site can therefore be excluded. If all plans and projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.'*
  - In *Wealden v SSCLG* [2017] EWHC 351 (Admin) (2017), Mr. Justice Jay accepted that if the contribution of an individual plan or project to traffic growth or resulting air quality effects was 'very small indeed' (quoting a notional 20 AADT), it could be legitimately and legally excluded from 'in combination' assessment. This view is in agreement with that of Advocate-General Sharpston.
- 5.24 Therefore, Likely Significant Effects of the Fairford NP on the North Meadows & Clattinger Farm SAC 'in-combination' can be excluded in the opinion of the report authors. The site is screened out from Appropriate Assessment in relation to this impact pathway.

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<sup>34</sup> The baseline nitrogen deposition rates reported in the Missing Link HRA are lower than the maximum rates reported for the SAC on APIS. However, the data reported on APIS are based on the 5km grid square within which the SAC is situated and therefore do not account for variation in deposition rates across the SAC area.

## 6. Appropriate Assessment

### Introduction

- 6.1 The law does not prescribe how an Appropriate Assessment (AA) should be undertaken or presented but the AA must consider all impact pathways that have been screened in, whether they are due to policies alone or to impact pathways that arise in-combination with other projects and plans. That analysis is the purpose of this section. The law does not require the 'alone' and 'in combination' effects to be examined separately provided all effects are discussed. This section of the Report to Inform HRA is intended to provide the necessary technical analysis to enable the competent authority (Cotswold District Council) to reach a conclusion regarding adverse effects of the NP on the integrity of internationally important wildlife sites, in accordance with Regulation 105 and 106 of the Conservation of Habitats and Species Regulations 2017 (as amended).
- 6.2 The Fairford NP allocates up to 80 dwellings and this extent of growth is not considered large enough to have the potential for adverse effects on site integrity alone. However, LSEs must also be discussed in-combination, taking account of the growth in parishes adjoining Fairford. The Cotswold District Local Plan (CDLP) provides for 8,400 new dwellings in the period up to 2031. Therefore, the CDLP provides an appropriate starting point to assess in-combination effects of the Fairford NP on European Sites. Overall, the Fairford NP accounts for only approximately 1% of the development expected in the wider geographic area.
- 6.3 The HRA screening exercise undertaken in Chapter 5, Appendix A, Table 5 indicated one site allocation policy for which Likely Significant Effects on European Sites cannot be excluded, including the impact pathways recreational pressure and water quantity, level and flow.

### Recreational Pressure

#### North Meadow and Clattinger Farm SAC

- 6.4 The North Meadow and Clattinger Farm SAC is designated for lowland hay meadows, which are sensitive to excessive trampling damage particularly when visitors venture off trails. Natural England's Site Improvement Plan indicates that visitor pressure is especially high in the flowering time of the snake's-head fritillary, leading to localised damage of plant communities. The SIP also specifies that a National Nature Reserve management plan is to be implemented to minimise the impact of trampling damage generated by recreational visitors. The closest component part of the SAC, the North Meadow SSSI, lies approx. 5.5km to the south-west of Fairford NP area.
- 6.5 The Cricklade North Meadow NNR is widely advertised as a recreation destination. For example, the VisitWiltshire website ([www.visitwiltshire.co.uk](http://www.visitwiltshire.co.uk)) describes the background to the site, praises the famous fritillaries and their beautiful colours, and promotes the guided walking tours provided by Natural England (NE). NE has also produced an information leaflet for the NNR, discussing the importance of the site, how to get there, its main attractions and management measures. The active promotion of the site is likely to further increase visitor numbers at the site and may also attract future residents of Fairford. Without active mitigation measures this could exacerbate the impact of trampling damage on the SAC's fritillaries. Lowland hay meadows comprise species-rich swards with plants differing in their sensitivity to trampling damage. Trampling may reduce species diversity, with more hardy herbs being more likely to survive.
- 6.6 It is important to note that the Fairford NP allocates a relatively small amount of residential growth of 80 dwellings, equating to 192 additional residents. Generally, this modest housing growth would not be expected to lead adverse effects on site integrity on its own. However, the HRA process needs to consider the 'in-combination' effects with growth delivered in adjoining parishes. The overarching Cotswold District Local Plan (CDLP) provides for at least 8,400 dwellings in the period to 2031 (at least 20,160 new residents), some of which may also fall within the catchment of the SAC. Furthermore, the 'in-combination' approach is particularly relevant in this instance, because visitor numbers in the SAC are at or above capacity according to references to a Natural England consultation response in the Cotswold Local Plan HRA.

- 6.7 However, Natural England, who own and manage the site, have put measures in place to protect its conservation interest. For example, during winter flooding Natural England ask the public to stay off the site, because heavy footfall in wet conditions leads to ground compaction and damage to young fritillary shoots. Furthermore, the site also comprises waymarked routes (orange, blue and yellow) that direct visitors along established tracks, while being able to enjoy the site's main features. The public is asked to stay on the advertised routes and avoid having a closer look at flowers. It is also mandatory to keep dogs on leads to protect the fritillaries and ground-nesting birds. A full list of the management measures deployed in the SAC can be found at <https://crickladedcourtleet.org.uk/>.
- 6.8 Moreover, while the Fairford administrative boundary lies 5.5km from the SAC, the settlement of Fairford lies 8km from the SAC and is separated from it by the A419. At a distance of 8km from the SAC, new Fairford residents may fall within the visitor catchment of the site but if so they will be on the fringes i.e. it is unlikely a significant number of residents regularly visit the SAC. Due to the presence of the A419, driving to the SAC from Fairford is not straightforward, requiring one to join the A419 at Wharf Farm, drive south one junction to the Calcutt junction and then double back through Cricklade. In contrast, Cotswold Water Park SSSI and Welford Meadows SSSI are both adjacent to Fairford and will provide a similar recreational experience on much larger parcels of land. It is unlikely Fairford residents would regularly visit North Meadow in significant numbers in contrast to these larger and closer wildlife sites.
- 6.9 Finally, the HRA of the Cotswold Local Plan concluded that *'North Meadow and Clattinger Farm SAC [is] located a long way from much of the housing proposed in parts of the District other than the south, and therefore it is likely that more conveniently accessible areas of open space closer to where people live will be used for most recreational activities. Any residual increase in visitor numbers that might occur from additional housing development in Cotswold District at the European sites would be likely to be dispersed across different locations, diluting the effects of recreation activities. Therefore, it is unlikely that any one European site would see a significant increase in visitor numbers as a result of the development proposed through the Local Plan'*. Nonetheless, a commitment was made in Local Plan policy INF7 (Green Infrastructure) for *'Cotswold District Council to work with key stakeholders including Natural England to develop appropriate mitigation'*. On this basis, a conclusion was drawn that delivery of 8,400 dwellings in Cotswold District and any mitigation strategy for the Local Plan that is being devised by Cotswold Council with Natural England is very unlikely to be so finely calibrated that the addition of a further 80 dwellings (c. 1%) at a distance of 8km from the SAC would trigger the need for additional mitigation, particularly given the much closer proximity of other larger areas of publicly accessible semi-natural habitat that are much easier to access from Fairford and are likely to mean Fairford residents rarely visit the SAC.
- 6.10 The Fairford NP also contains several policies that are likely to minimise the residual likelihood of any new residents of Fairford travelling to the SAC for recreation. For example, the provision and protection of local greenspaces is an established mitigation tool that helps absorb recreation in less sensitive sites. Policy **FNP8 (Protecting Local Green Spaces)** designates the Walnut Tree Field, Upper Green and Coln House Playing Field as protected outdoor spaces, which are likely to attract at least some of Fairford's new residents. **Policy FNP14 (A New Low Carbon Community In Fairford)** establishes that development proposals contributing to Fairford's allocation of 80 new dwellings will be required to deliver one or more areas of publicly accessible open spaces, which should include a children's play area and community gardens / allotments. Again, this policy will help to engage residents locally, rather than visiting the North Meadow & Clattinger Farm SAC.
- 6.11 Overall, it is therefore considered that the additional growth in the Neighbourhood Plan would not result in an adverse effect on the integrity of the SAC. This is based on the package of visitor management measures already devised by Natural England, the relative distance of Fairford town from the SAC (8km) and comparative difficulty accessing the SAC compared to other closer areas of attractive semi-natural greenspace, and the overarching policy framework in the Local Plan and Neighbourhood Plan including a Local Plan commitment to develop strategic mitigation for the district.
- 6.12 Policies that help prevent adverse effects on the integrity of European Sites are also included in the Cotswold District Local Plan (CDLP), the planning document guiding development in Fairford NP area. **Policy EN8 (Biodiversity and Geodiversity: Features, Habitats and Species)** of the

CDLP states that '4. *Proposals that would result in the loss or deterioration of irreplaceable habitats and resources, or which are likely to have an adverse effect on internationally protected species, will not be permitted.*' The protection of European Sites is further strengthened in **Policy EN9 (Biodiversity and Geodiversity: Designated Sites)**, which clarifies that '1. *Internationally designated wildlife sites... will be safeguarded from development that could cause a significant effect that would adversely affect their integrity.*' Overall, these policies ensure that residential development which would result in unsustainable, adverse recreation impacts will not be permitted.

- 6.13 In consultation with Cotswold Council, it was suggested that, notwithstanding the conclusion above, reference should be made in both the HRA and Fairford Neighbourhood Development Plan to the need for any developer of a housing site in Fairford to comply with the emerging Interim Mitigation Strategy for North Meadow that is currently being prepared by a consultant on behalf of Swindon Borough Council for their Local Plan Review.
- 6.14 AECOM has requested a copy of the interim Mitigation Strategy but it is not available to the authors at the time of writing. However, in line with advice from Cotswold District Council **it is recommended that for the avoidance of doubt a reference to the emerging Interim Mitigation Strategy and the need for developers to comply with it should be added to Policy FNP14.**
- 6.15 Overall, it is determined that, with this addition to policy text, there will be no adverse 'in-combination' effects of the Fairford NP. No policy recommendations are made.

## Water Quantity, Level and Flow

### North Meadow & Clattinger Farm SAC

- 6.16 The water level in any European site can be negatively impacted in two ways. A proliferation of impermeable surfaces near a European site or its tributaries might result in faster runoff rates and / or flash floods, leading to higher water levels than normal. However, due to the long distance between the SAC and Fairford, an increased flood risk due to the NP was considered unlikely and screened out from Appropriate Assessment. In contrast, water abstraction for potable water supply may lead to reduced baseline water levels in tributaries and European Sites themselves. An increased abstraction of water for the supply to residential dwellings is the main pathway in which the Fairford NP could affect the North Meadow & Clattinger Farm SAC. NE's Site Improvement Plan identifies inappropriate water levels as the main pressure / threat to the lowland hay meadows in the SAC, which could lead to a reduction in the nutrient replenishment of the site.
- 6.17 The company that is responsible for the potable water supply in the area comprising Fairford is Thames Water. A new Water Resources Management Plan (WRMP) was published by the company in 2019, outlining the balance between supply and demand for water for a minimum planning period of 25 years. Thames Water's supply area extends from Cirencester in the west to Dartford in the east, and from Banbury in the north to Guildford in the south. The company supplies approx. 2,600 million litres of water to 10 million people and 250,000 businesses daily. A large portion of the water supply is fulfilled through large storage reservoirs served by the River Thames and River Lee. For purposes of resource planning, the Thames Water's WRMP divides the water supply area into six Water Resource Zones (WRZs). Fairford lies in the Swindon and Oxfordshire (SWOX) WRZ. WRZs are geographic areas in which abstraction and distribution of water is largely self-contained and therefore resource development options outside the SWOX WRZ are unlikely to materially affect the water level in the North Meadow & Clattinger Farm SAC.
- 6.18 An assessment of the baseline supply-demand balance is typically undertaken to determine whether a WRMP may result in adverse effects on the integrity of European Sites. Thames Water's WRMP highlights that the supply-demand balance for the SWOX WRZ will remain in surplus throughout the entire plan period under dry year annual average conditions. Therefore, under dry conditions, modelled as a precautionary measure, no further water resources will need to be developed or abstraction licenses increased to meet the growing demand in Cotswold District. However, the WRMP stipulates that a deficit in the supply-demand balance will occur under peak week utilisation conditions, amounting to 11.3 MI/d in 2044 and rising to 31.2 MI/d in

2099. Peak week conditions are therefore seen as the main investment driver. The water resource options employed to address these deficits must next be assessed to determine whether they may have implications for the water level in the North Meadow & Clattinger Farm SAC.

- 6.19 Water resource options cover a range of different elements, including changes to the use of resources (e.g. increased water abstraction from rivers and groundwater), changes to raw water systems (e.g. adaptations of storage reservoirs) and network elements (e.g. upgrades to distribution piping and leakage reductions). The development of new water resources and increases of consented abstractions from surface waterbodies are most likely to affect the water level / volume in water-dependent European Sites. Thames Water developed an initial unconstrained options list, which was then slimmed down to a package of feasible constrained options. As a statutory requirement, the WRMP also underwent HRA to assess potential adverse effects on designated sites.
- 6.20 Three options were assessed for their potential impacts on water levels in the North Meadow & Clattinger Farm SAC, including the Radcot Water Treatment Works (WTWs) increased treatment capacity (24 Ml/d), increased abstractions at the Ashton Keynes borehole pumps (2.5 Ml/d) and the Wessex to SWOX inter-company water conveyance asset. The following conclusions on adverse effects of these options were reached:
- Due to the relatively long distance of Radcot WTW to the SAC (approx. 6.2km) no effects on the hydrological integrity of the site were predicted
  - Abstraction from the Ashton Keynes borehole pumps is derived from the aquifer that is not in continuity with the overlying impermeable Oxford Clay formation (which is hydrologically linked to the North Meadows & Clattinger Farm SAC)
  - The inter-conveyance system lies at 4.3km from the SAC and no hydrological impacts are expected from its operational use
- 6.21 One of the main purposes of the HRA process is to ensure that an adequate policy framework is in place to protect the integrity of European Sites. While the Fairford NP does not contain specific policy wording that addresses the need to protect water levels in designated sites, the overarching Cotswold District Local Plan (CDLP) has inbuilt policy safeguards. For example, Policy EN9 (Biodiversity and Geodiversity: Designated Sites) specifies that '*1. Internationally designated wildlife sites... will be safeguarded from development that could cause a significant effect that would adversely affect their integrity.*' By definition, this would also apply to housing development that has the potential to reduce the volume of freshwater supplied to and the frequency of flooding of the North Meadow & Clattinger Farm SAC. Furthermore, Policy INF8 (Water Management Infrastructure) states that '*1. Proposals will be permitted that: a. take into account the capacity of existing off-site water and wastewater infrastructure and the impact of development on it, and make satisfactory provision for improvement where a need is identified that is related to the proposal.*' Effectively this ensures that the water provision infrastructure will need to be reviewed and, where necessary, improved to ensure that a sustainable water supply to new housing development can be provided. This is positive because the review of the water supply will be required to be set into the context of designated sites, in turn ensuring that water levels in the SAC are protected.
- 6.22 Overall, Thames Water's WRMP does not involve water resource options that are hydrologically linked to the North Meadow & Clattinger Farm SAC and the CDLP contains a policy framework that protects the hydrological conditions in European Sites. Therefore, it is concluded that the Fairford NP will not result in adverse effects on the SAC regarding water level, flow and volume 'in-combination' with other plans and projects. No additional policy recommendations for inclusion in the Fairford NP are made.

## 7. Conclusions

- 7.1 This Report to Inform Cotswold District Council's formal HRA of the Fairford NP has assessed the potential implications of the plan on the North Meadow & Clattinger Farm SAC relating to the impact pathways recreational pressure, water quality, water quantity, level and flow, and atmospheric pollution.
- 7.2 An initial screening assessment determined that the Council would be able to exclude LSEs in relation to water quality and atmospheric pollution. While the lowland hay meadows in the North Meadow & Clattinger Farm SAC is sensitive to water quality changes, it was determined that there is no hydrological connectivity between the point of discharge of the WWTW processing sewage from Fairford and the section of the R. Thames that seasonally floods the SAC. Regarding atmospheric pollution the screening for LSEs section highlighted that the section of sensitive habitat closest to a potential commuter route linked with Fairford (the A419), lies at a distance of approx. 180m. At this distance, motorised traffic is likely to be a minor contributor to nitrogen deposition compared to agriculture. Furthermore, the habitat structure and sward composition of hay meadows is predominantly determined by management practices.

### North Meadow & Clattinger Farm SAC

#### Recreational Pressure

- 7.3 This report considered that Cotswold District Council would need to undertake an Appropriate Assessment regarding recreational pressure due to the NPs allocation of 80 dwellings, especially 'in-combination' with the housing growth set out for the district in the CDLP (8,400 dwellings). According to Natural England, the North Meadow & Clattinger Farm SAC is a popular recreation destination. However, an appropriate management plan already exists. For example, in winter and early spring, the public is asked to stay off the site in order to prevent soil compaction and damage to sensitive fritillary shoots. Furthermore, visitors to the SAC are asked to stick to the three waymarked routes (comprising different interest features), enabling them to enjoy the wildlife while protecting the site's conservation interest. Dogs are required to be kept on the lead. Moreover, the settlement of Fairford is 8km from the SAC, the SAC is not straightforward to reach from Fairford and there are larger areas of attractive open space immediately adjacent to Fairford. In addition, Cotswold District Council has a commitment to develop a strategic mitigation solution for the whole district very unlikely to be so finely calibrated that the addition of a further 80 dwellings (c. 1%) at a distance of 8km from the SAC would trigger the need for additional mitigation. Finally, the Fairford NP also contains several policies that are likely to minimise the residual likelihood of any new residents of Fairford travelling to the SAC for recreation, notably requiring the delivery of recreational greenspace as part of the new allocation.
- 7.4 In consultation with Cotswold Council, it was suggested that, notwithstanding the above, reference should be made in both this Report to Inform HRA and Fairford Neighbourhood Development Plan to the need for any developer of a housing site in Fairford to comply with the emerging Interim Mitigation Strategy for North Meadow that is currently being prepared by a consultant on behalf of Swindon Borough Council for their Local Plan Review.
- 7.5 AECOM has requested a copy of the interim Mitigation Strategy but it is not available to the authors at the time of writing. However, in line with advice from Cotswold District Council as competent authority **it is recommended that for the avoidance of doubt a reference to the emerging Interim Mitigation Strategy and the need for developers to comply with it should be added to Policy FNP14.**
- 7.6 **Overall, with this amendment to policy included, it is the view of the authors that Cotswold District Council would be able to conclude that the Fairford NP will not result in 'in-combination' adverse effects on the integrity of the SAC regarding recreational pressure.**

#### Water Quantity, Level and Flow

- 7.7 The lowland hay meadows in the SAC are sensitive to changes in the water quantity, level and flow in the site. The housing allocated in the Fairford NP will be connected to the potable water

supply, which may reduce the volume of freshwater (and nutrient) input to the site. Fairford lies within Thames Water's Swindon and Oxfordshire (SWOX) Water Resource Zone (WRZ). The current WRMP indicates that the supply-demand balance in the WRZ is forecast to be in a deficit of 11.3 Ml/d by 2044. However, the Appropriate Assessment demonstrated that the water resource options investigated by Thames Water will not lead to water level changes in the North Meadow & Clattinger Farm SAC. The WRMP has a strong focus on leakage reduction, increasing water efficiency and reducing water consumption. Any resource options that would involve increases to abstraction volumes are not hydrologically connected to the SAC. For example, the Ashton Keynes borehole pumps extract water from an aquifer that is separated from the aquifer supplying the SAC (i.e. the Oxford Clay Formation). **Overall, it was concluded that Cotswold District Council would be able to conclude that the Fairford NP will not result in 'in-combination' adverse effects on the integrity of the SAC regarding water quantity, level and flow.**



## Appendix A

**Table 3. Screening table showing the Test of Likely Significant Effects (LSEs) results of policies contained within the Fairford Neighbourhood Plan. Where a screening result is shaded in green there will be no LSEs on European sites. Orange shading means that there is a potential for LSEs on European sites from the impact pathways identified in the box.**

Policy	Description	Test of Likely Significant Effects (LSEs)
<b>Policy FNP1 – The Fairford and Horcott Development Boundaries</b>	The Neighbourhood Plan redefines Development Boundaries at Fairford and Horcott, as shown on the Policies Map (Plan B, <b>Error! Reference source not found.</b> ), for the purpose of applying other development plan policies relating to appropriate development within the built-up area and in the countryside.	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that redefines the development boundaries at Fairford and Horcott.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP1 is therefore screened out from Appropriate Assessment.</p>
<b>Policy FNP2 – Providing a New Burial Ground</b>	<p>Proposals for a new burial ground will be supported, provided:</p> <ul style="list-style-type: none"> <li>ancillary buildings and structures are kept to a minimum for the operations of the use and are designed to minimise their effects on the landscape;</li> <li>they provide sufficient off-street car parking spaces; and</li> <li>The location is appropriate in terms of ground condition and flood risk</li> </ul>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This policy supports proposals for a new burial ground in Fairford.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP2 is therefore screened out from Appropriate Assessment.</p>
<b>Policy FNP3 – Maintaining Viable Community Facilities</b>	<p>The Neighbourhood Plan identifies the following land and buildings as community facilities for the purpose of applying Local Plan policies in relation to their protection and improvement:</p> <ul style="list-style-type: none"> <li>Fairford Community Centre</li> <li>Palmer Hall</li> </ul>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that identifies and protects community facilities, such as Fairford Community Centre and several sports grounds.</p>

	<ul style="list-style-type: none"> <li>• Fairford Library</li> <li>• The Fairford Town Football Club ground and adjacent practice playing field</li> <li>• Fairford Bowling Club</li> <li>• Fairford Cricket Club Ground</li> <li>• The Fairford Junior Rugby Club pitches</li> <li>• The Fairford Rugby Club pitches (at Coln House School)</li> <li>• Fairford Youth Football Club pitches</li> <li>• Fairford Tennis Club</li> <li>• Farmor's Sports Centre</li> <li>• Riverside Garden</li> </ul>	<p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP3 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP4 – Managing Flood Risk</b></p>	<p>All sources of flood risk<sup>35</sup> must be considered at both the site selection and application stages, and the sequential test used to divert development to areas with lower probability of flooding, in accordance with NPPF guidance. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.</p> <p>In addition to meeting national and strategic planning policy requirements, proposals for development on land identified by the Environment Agency as lying within either Flood Zone 2 or 3, or in areas of Flood Zone 1 where there is evidence of flood risk from sources other than fluvial, will require a site-specific Flood Risk Assessment (FRA) , using appropriate calculations based on the highest expected groundwater levels for the area (200 year maximum), at the first application stage. Proposals will only be supported where it can be demonstrated in the Assessment that:</p> <ol style="list-style-type: none"> <li>a. They include appropriate site-specific measures to address effectively all the identified surface and ground water issues.</li> <li>b. Any residual flood risks can be managed on the site and will not increase flood risk beyond the site.</li> </ol> <p>Where this is not demonstrated satisfactorily permission will be refused.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a positive policy that aims at managing flood risk. For example, a site-specific Flood Risk Assessment will be required in Flood Zones 1, 2 and 3. Furthermore, site-specific measures will be required to address any surface and groundwater issues. These measures will reduce potential washout of organic and inorganic water quality contaminants into the River Thames.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP4 is therefore screened out from Appropriate Assessment.</p>

<sup>35</sup> "Flood risk" means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources, as stated in NPPF guidance.

	<p>Land identified by the Environment Agency as lying within Flood Zone 1 but that is subject to high groundwater levels such that adequate and effective<sup>36</sup> SuDS drainage systems cannot be provided should be preserved as green space to provide for flood water storage/attenuation.</p>	
<p><b>Policy FNP5 – Investing in Utilities’ Infrastructure Improvements</b></p>	<p>By “Utilities Infrastructure” this policy means not only sewerage and water supply (as set out in INF1 and INF8 of the CDC Local Plan) but also broadband. Flood protection is covered in FNP4.</p> <p>Planning permission will only be granted to a development intending to connect to the sewer network if the sewer network can accommodate the additional demand for sewage disposal either in its existing form or through planned improvements to the system in advance of the construction of the development, to ensure that the environment and the amenity of local residents are not adversely affected.</p> <p>Such “planned improvements to the system” may take the form of reduced surface and ground water inflow into the sewers, increased pumping station capacity or increased sewage treatment works capacity. This plan does not stipulate which, but the effect must be to accommodate fully the additional demand.</p> <p>Where a need for new or improved off-site utility, infrastructure has been identified in order to support new development, any resulting proposals will only be supported where the proposed utility infrastructure will be delivered in line with an agreed phased timescale.</p> <p>Development proposals will be required to make either satisfactory arrangements for the direct implementation of the off-site infrastructure, and/or an agreed financial contribution towards its provision by another party within the agreed timescale.</p> <p>Planning permission for a development intending to connect to the sewer network must include conditions that require that new homes must not be occupied until it is demonstrated that the sewerage system has adequate capacity to accommodate the additional flow generated by the</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that ensures that appropriate infrastructure is in place to accommodate new development. For example, sufficient capacity at Wastewater Treatment Works (WwTWs) will need to be in place prior to planning consent being given to development proposals. This will protect the water quality in surface waterbodies such as the R. Thames, which frequently floods the North Meadow &amp; Clattinger Farm SAC. Consequently, it will also ensure that no adverse water quality effects will occur in its lowland hay meadows.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP5 is therefore screened out from Appropriate Assessment.</p>

<sup>36</sup> In accordance with EA and CIRIA guidance, and National Standards for sustainable drainage **Invalid source specified.**

	<p>development. The condition may allow that the physical connection of new homes to the sewage treatment works may be delayed until enough homes are occupied to achieve sufficient flow through the sewerage system to avoid issues of septicity, during which time approved environmentally acceptable alternative arrangements (e.g. tankering) may be used, subject to Council agreement.</p> <p>All new development must have sufficient infrastructure to provide electric vehicle charging points to meet future demand.</p>	
<p><b>Policy FNP6 – Managing Traffic in the Town</b></p>	<p>Proposals for a residential scheme of 10 or more homes or for a commercial scheme of more than 1000 sq.m. gross internal area must identify and quantify in their transport assessments the effects of traffic generated by the scheme on its own, and in combination with other consented and allocated schemes, on the Fairford Conservation Area and on other heritage assets in the Town Centre. Where the potential for harm has been identified then the proposals must make provision for the necessary mitigation measures to avoid contributing to the harm caused to those assets. Transport Assessments must demonstrate that adequate electric vehicle charging points will be provided.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a policy that manages traffic in Fairford town, such as through the provision of Transport Assessments. Furthermore, for residential schemes of 10 or more homes, adequate electric vehicle charging points will be required. This may help reduce the volume of fossil-fuelled cars in Fairford and nitrogen deposition in the North Meadow &amp; Clattinger Farm SAC, which is sensitive to atmospheric pollution.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Overall, Policy FNP6 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP7 – Improving Access to Visitor Attractions</b></p>	<p>Proposals within the Plan area to improve pedestrian and cycle access between Fairford and attractions within the Cotswold Water Park, Lechlade, the Thames and Severn Canal route and the Thames Path will be supported.</p>	<p>Likely Significant Effects of this policy on European Sites cannot be excluded.</p> <p>This policy promotes pedestrian and cycle access between Fairford and several attractions in Fairford (e.g. Cotswold Water Park). While facilitating access to non-designated sites is generally considered to be positive, the North Meadow &amp; Clattinger Farm SAC is situated to the west and east of the water park and could also experience an increase in visitor numbers as a result of this policy.</p>

	<p>The following potential impact pathway is associated with this policy:</p> <ul style="list-style-type: none"> <li>• Recreational pressure</li> </ul> <p>Therefore, Policy FNP7 is screened in for Appropriate Assessment 'in-combination'.</p>
<p><b>Policy FNP8 – Protecting Local Green Spaces</b></p> <p>The Neighbourhood Plan designates the following land as Local Green Spaces, as shown on the Policies Map:</p> <ol style="list-style-type: none"> <li>The Walnut Tree Field;</li> <li>Upper Green;</li> <li>Coln House Playing Field.</li> </ol> <p>In accordance with Policy EN3 of the Cotswold District Local Plan (CDLP) para.10.3.1 the FNP identifies these green areas as being of particular importance, where development will not be permitted except in very special circumstances.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a positive policy that protects local greenspaces in Fairford. Enabling access to outdoor spaces is considered to be a key mitigation approach to absorb recreation locally and reduce recreational pressure in sites designated for their conservation interest.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP8 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP9 – Protecting the Fairford Horcott Local Gap</b></p> <p>The Neighbourhood Plan defines the Fairford to Horcott Local Gap on the Policies Map.</p> <p>Development proposals within the Local Gap will only be supported if they do not harm, individually or cumulatively, its open character.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that defines and protects the open character of the Fairford to Horcott Local Gap.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP9 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP10 – River Coln Valued Landscape</b></p> <p>The FNP identifies land between the River Coln and Fieldway, as shown on the Policies Map, as a valued landscape.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p>

	<p>Development proposals in the River Coln Valued Landscape, that may otherwise be suited to a countryside location, will only be supported if they will maintain the essential open character of the land.</p>	<p>This is a development management policy that defines and protects the open character of the River Coln and Fieldway Valued Landscape.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP10 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP11 – Valuing Hedgerows and Trees</b></p>	<p>Development proposals that require the removal of trees should make provision for their replacement with trees of (wherever possible) native species within the site boundary. Where appropriate each tree removed should be replaced with at least two new trees.</p> <p>Development proposals that require the removal of all or part of a hedgerow should make provision in the landscape scheme:</p> <ol style="list-style-type: none"> <li>a) either for its replacement within the site of hedgerow of a similar length, height and form, and of similar or greater density of native species to match existing or nearby hedging;</li> <li>b) or to deliver biodiversity value of the equivalent to that lost with additional hedgerow or other shrub or tree planting elsewhere;</li> <li>c) or to deliver a replacement boundary treatment of a different type which is more appropriate to the site and its surroundings and which respects and complements the wider development proposal.</li> </ol> <p>Proposals for new planting should link, where appropriate, existing landscape features such as patches of woodland to watercourses or ponds. Hedgerows should be integrated into the development boundary features or be part of the open space provision to ensure their long-term management and retention.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that protects hedgerows and trees in Fairford. There are no European Sites designated for animal species that rely on such functionally linked habitats linked to the Fairford Neighbourhood Plan. However, this policy is positive for the environment as it provides and / or protects wildlife corridors in Fairford.</p> <p>The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP11 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP12 – Achieving High Standards of Design</b></p>	<p>Proposals for new development, including extensions to existing buildings, should be of the highest design standards, in accordance with the Cotswold Design Code given effect by the relevant policies of the</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p>

	<p>CDLP and should have regard to the key design principles set out <b>Error! Reference source not found..</b></p> <p>The proposals should have specific regard to:</p> <ol style="list-style-type: none"> <li>a) enhancing key views, particularly to the Church of St Mary's, across Upper and Lower Green, and from within the Fairford Conservation Area and Special Landscape Area to the surrounding countryside;</li> <li>b) maintaining key views listed in <b>Error! Reference source not found.;</b></li> <li>c) Any conservation area appraisal or conservation area management plan.</li> </ol>	<p>This is a development management policy that sets out design standards for new developments. All planning proposals will have to adhere to the Cotswold Design Code and have specific regard to enhancing / maintaining key views.</p> <p>However, design standards have no relevance to European Sites. The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP12 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP13 – Conserving Non-Designated Heritage Assets</b></p>	<p>The FNP identifies the Local Heritage Assets as listed below for the purpose of applying CDLP in relation to sustaining and enhancing non-designated heritage assets.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that provides for the conservation of non-designated heritage assets.</p> <p>However, the protection of heritage assets has no direct relevance to European Sites. The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP13 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP14 – A new Low Carbon Community in Fairford</b></p>	<p>The Neighbourhood Plan proposes land between Leaffield Road and Hatherop Road (north of John Tame Close and St. Mary's Drive, as shown on the Policies Map) for a low, or zero, carbon residential development.</p> <p>Proposals for housing development of around 80 homes will be supported, subject to delivery of a comprehensive proposal satisfying the following criteria:</p> <ul style="list-style-type: none"> <li>• Development is not commenced until the necessary upgrade and improvements to the local utilities infrastructure are as provided for by Policy;</li> </ul>	<p>Likely Significant Effects of this policy on European Sites cannot be excluded.</p> <p>This policy provides for a new low carbon residential development comprising 80 homes on land between Leaffield Road and Hatherop Road. It further sets out specific development criteria, including the provision of adequate utilities infrastructure, design standards and accessible open space, and the avoidance of flood risk areas.</p> <p>The following potential impact pathways are associated with this policy:</p>

<ul style="list-style-type: none"> <li>• Development conforms with the requirements of FNP15 to deliver sustainable housing;</li> <li>• The layout and landscape scheme incorporate appropriate measures, including tree planting, to mitigate the visual effects of the development on the countryside to the west, north and east of the site, with provision for this to be maintained in perpetuity;</li> <li>• Development satisfies, as a minimum, the standards required for the “Building with Nature<sup>37</sup> – Design” level. Developments that meet the higher levels (“Good”, “Excellent”) of the standard would be strongly supported.</li> <li>• The design and landscaping have regard for the setting of the Fairford Conservation Area;</li> <li>• Provision is made for a link road to give access between the schools and the A417 to the east of the town, for a dropping-off point away from the school and a safe walking route to the schools;</li> <li>• The scheme provides one or more areas of publicly accessible open space, including a children’s play area (LEAP) and a community garden or allotments;</li> <li>• Provision is made for the delivery of self or custom build plots in line with CDLP policy H1;</li> <li>• The scheme keeps housing away from areas prone to surface or ground water flooding and incorporates measures to contain and attenuate surface water either in low lying areas within the site boundary or on other land within the control of the applicant in accordance with FNP4; and</li> <li>• Provision is to be made for affordable housing in accordance with CDLP policy H2.</li> </ul>	<ul style="list-style-type: none"> <li>• Recreational pressure</li> <li>• Water quality</li> <li>• Water quantity, level and flow</li> <li>• Atmospheric pollution</li> </ul> <p>Overall, Policy FNP14 is screened in for Appropriate Assessment ‘in-combination’.</p>
<p><b>Policy FNP15 – Sustainable Homes and Housing Need</b></p> <p>Subject to the development being found to be acceptable when judged against other policies in the FNP, innovative approaches to the construction of low carbon homes which demonstrate sustainable use of resources and high energy efficiency levels will be supported. Examples</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p>

<sup>37</sup> <https://www.buildingwithnature.org.uk/how-it-works>



	<p>would include, but would not be limited to earth sheltered, rammed earth, or straw bale construction, construction to Passivhaus standards, conversion to EnerPHit standards.</p> <p>The sensitive retrofitting of energy efficiency measures and the appropriate use of micro-renewables in historic buildings will be encouraged, including the retrofitting of listed buildings, buildings of solid wall or traditional construction and buildings within conservation areas, whilst safeguarding the special characteristics of these heritage assets for the future.</p> <p>Proposals for housing development should provide a mix of housing types that have an emphasis on two and three-bedroom houses.</p> <p>Proposals for new housing that go beyond the requirements of Building Regulations and implement the design criteria set out in “The Lifetime Homes Design Guide” will be supported.</p> <p>In residential developments all garage and off-street parking must include provision for the safe charging of electrical vehicles. Schemes including communal parking areas must include a scheme for communal charging points.</p>	<p>This is a development management policy that stipulates the provision of sustainable homes and an adequate housing mix. Sustainable features to be provided include construction to Passivhaus standards and conversion to EnerPHit standards.</p> <p>While this is a positive policy for the environment, there are no direct implications for European Sites. The policy does not provide for a location and / or quantum of residential or employment development.</p> <p>Policy FNP15 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP16 – Growing Our Local Economy</b></p>	<p>All new non-residential buildings should achieve the BREEAM Excellent standard.</p> <p>Insofar as planning permission is required proposals to intensify the existing business uses on the Whelford Lane Industrial Estate, as shown on the Policies Map, will be supported, provided they use the existing access to the A417.</p> <p>Proposals for a change of use of Coln House School, as shown on the Policies Map, from its established C2 (residential institutions) use will only be supported if they comprise the reuse and/or conversion of the site to include B1 business and/or community uses.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that addresses economic growth in Fairford. However, the policy mainly proposes the intensification of existing business uses, rather than promoting additional employment development.</p> <p>The policy does not provide for a location and / or quantum of new residential or employment development.</p> <p>Policy FNP16 is therefore screened out from Appropriate Assessment.</p>

<p><b>Policy FNP17 – Sustaining Successful Centre</b></p>	<p><b>a Town</b> The Neighbourhood Plan identifies the Town Centre, as shown on the Policies Map, for the purpose of applying other development plan policies relating to retail development.</p> <p>Insofar as planning permission is required proposals for the conversion of A1 retail or B1 business premises in the town centre to residential use will not be supported. The loss of main town centre uses on the ground floor within the Town Centre boundary identified on the Policies Map will be supported provided the development does not harm the vitality and viability of the Town Centre and evidence has been submitted to demonstrate that the property has been continually, actively and effectively marketed for at least 12 months and that the use is no longer of commercial interest.</p> <p>Proposals for conversion to residential use will be supported on the upper floors of business premises in the Town Centre, provided that the conversion would not adversely affect the viability of the premises for commercial use.</p> <p>Proposals to improve the Market Place to create a more attractive environment for shoppers and visitors, including expanding the pedestrian area in front of the Bull Hotel, will be supported, provided any loss of existing car parking spaces is compensated for by new spaces within or on the edge of the Town Centre.</p>	<p>There are no Likely Significant Effects of this policy on European sites.</p> <p>This is a development management policy that sustains Fairford’s town centre. For example, the conversion of existing business premises to residential development will be resisted. Furthermore, improvements to the Market Place to create a more attractive environment will be supported.</p> <p>The policy does not provide for a location and / or quantum of new residential or employment development, other than the quantum of housing allocated in Fairford in the overarching Cotswold District Local Plan.</p> <p>Policy FNP17 is therefore screened out from Appropriate Assessment.</p>
<p><b>Policy FNP18 – New Visitor Accommodation</b></p>	<p>Proposals for the development of new visitor accommodation or for a change of use to such accommodation will be supported, provided they are located either within the defined Fairford Development Boundary or comprise the appropriate and sustainable reuse of a redundant agricultural building in the countryside.</p>	<p>Likely Significant Effects of this policy on European Sites cannot be excluded.</p> <p>This is a development management policy that supports the development of new visitor accommodation in the defined Fairford Development Boundary. Such accommodation may increase the overall tourism activity in Fairford and increase the number of visitors in the North Meadow and Clattinger Farm SAC, particularly when viewed in context with Policy FNP7.</p> <p>The following potential impact pathways are associated with this policy:</p>

- Recreational pressure

Overall, Policy FNP18 is therefore screened in for Appropriate Assessment.

