M2 Junction 5 Improvements Habitats Regulations Assessment Stage 2 - Statement to Inform Appropriate Assessment March 2020

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Name	Role
Environment Support Centre	SES Environment Group

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C1. Executive summary

This Statement to Inform Appropriate Assessment has been produced by Atkins Ltd on behalf of Highways England and relates to identified potential for airborne pollution effects in relation to North Downs Woodlands Special Area of Conservation as a result of the proposed M2 Junction 5 Improvements Scheme.

Habitats Regulations Assessment screening undertaken as part of environmental assessment[1], identified five European Sites for consideration[2]. It discounted all potential likely effect pathways except one, relating to airborne nitrogen oxides, which are predicted to increase as a result of changes in operational traffic flow associated with the Scheme.

Detailed assessment of the extent and severity of changes in airborne pollution is presented in this document and it is concluded that the extent and severity of the changes are minor and therefore the potential for adverse effects on the integrity of North Downs Woodlands Special Area of Conservation can be discounted. Since all other likely significant effect pathways for this and any other European designated sites have been discounted, the overall conclusion is that the M2 Junction 5 Improvements Scheme will not have any adverse effects on the integrity any European designated sites.

[1] M2 Junction 5 Improvements Environmental Statement Addendum, Volume 2 – Appendix D.6 Amended Habitats Regulations Assessment Stage 1 Screening, January 2020
[2] North Downs Woodlands SAC, Queendown Warren SAC, Peter's Pit SAC and Medway Estuary and Marshes SPA and Medway Estuary Ramsar

C2. Introduction

2.1 Background

2.1.1 Atkins Ltd (Atkins) has been appointed by Highways England to provide a Statement to Inform Appropriate Assessment (SIAA) in relation to potential air quality impacts on North Downs Woodlands Special Area of Conservation (SAC) associated with the M2 Junction 5 Improvements Scheme (hereafter referred to as 'the Scheme').

2.1.2 The Scheme is located approximately 4 km south west of Sittingbourne in Kent (see Figure 1, Appendix A. It involves replacement of the Stockbury Roundabout with a new grade-separated junction and associated improvements to the connected road layout (see Section 2 for more detail).

2.1.3 Air quality modelling predicts an exceedance of the 1% Critical Level[3] Screening threshold recommended by Natural England guidance[4] for airborne NOx within part of North Downs Woodlands SAC closest to the Affected Road Network (ARN) associated with the Scheme (alone and in-combination with other projects). This is the only potentially significant European Site impact pathway that has been identified.

2.1.4 Habitats Regulations Assessment screening undertaken as part of environmental assessment[5], identified five European Sites for consideration[6] (further details are given in section 2 of this report). The need for Appropriate Assessment, in accordance with Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'), was identified during Habitats Regulations Assessment (HRA) Screening (Full details are provided in the Habitats Regulations Assessment Screening Document[7]). Following consultation comments from Natural England, the HRA Screening document was amended in January 2020 from the originally published version. Only one potential effect pathway relating to air quality was identified for one European Site (North Downs Woodlands SAC).

2.1.5 This SIAA is required to satisfy Regulation 63(2) of the Habitats Regulations, which requires anyone applying for consent for a project likely to have a significant effect on a European Site[8] to provide the Competent Authority[9] with the information that may reasonably be required to complete an Appropriate Assessment. In this case, Highways England is applying for the consent and the Secretary of State (SoS) for Transport is the Competent Authority.

2.1.6 The document has been prepared by a suitably qualified and experienced person

[3] The Critical Level is the relevant assessment benchmark for pollutant concentrations in the air. For NOx, the Critical Level stated by the UK's Air Pollution Information System (APIS; http://www.apis.ac.uk/) is 30 µg/m^3. The 1% Critical Level Screening threshold recommended by NE for airborne NOx is therefore 0.3 µg/m^3.
[4] Natural England (2018) NEA001 Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations Version: June 2018
[5] M2 Junction 5 Improvements Environmental Statement Addendum, Volume 2 – Appendix D.6 Amended Habitats Regulations Assessment Stage 1 Screening, January 2020
[6] North Downs Woodlands SAC, Queendown Warren SAC, Peter's Pit SAC and Medway Estuary and Marshes SPA and Medway Estuary Ramsar
[7] M2 Junction 5 Improvements Environmental Statement Addendum, Volume 2 – Appendix D.6 Amended Habitats Regulations Assessment Stage 1 Screening, January 2020
[8] European Site means a European site within the meaning of Regulation 8 of the Conservation of Habitats and Species Regulations 2017.
[9] Competent Authority means a Competent Authority within the meaning of Regulation 7 of the Conservation of Habitats and Species Regulations 2017.

following current good practice guidance published by Highways England[10], Natural England[11] and the Institute of Air Quality Management (IAQM)[12]. Document headings follow the outline contents provided in 'Appendix C' of the Highways England guidance; headings C1, C2 are included to orientate the reader.

2.1.7 The author is an Associate Ecologist with Atkins, a Chartered Environmentalist and a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM). He holds a PhD in ecology and a BSc (Hons) degree in Ecology and Conservation. With over 13 years of professional consultancy experience, he has undertaken ecological assessments (including HRA) for numerous infrastructure, energy and residential projects across the UK, including various scales of highways project. He has attended HRA training provided by CIEEM.

[10] Highways England (2019) LA 115 Sustainability and environment. Appraisal. Habitats regulations assessment, and Highways England (2019) HA207/07Sustainability and environment, Air quality, Revision 0
[11] Natural England (2018) NEA001 Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations Version: June 2018
[12] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0

C3. Background to the project ('Scheme')

3.1 Scheme details

Proposed design

3.1.1 A brief description of the Scheme is provided below; further details can be found in Chapter 2 of the Environmental Statement (ES) Volume 1 (Core Document B.1). The Scheme boundary is shown on Figure 1 in Appendix A**.**

3.1.2 Stockbury Roundabout will be replaced with a new grade-separated junction. The roundabout will remain at-grade and will be enlarged to accommodate connections to the roundabout. The A249 mainline will flyover the roundabout, with the approaches on embankments and retaining walls, and with two single-span bridges over the roundabout.

3.1.3 Four new slip roads will be provided, three of which include dedicated left turn lanes at the roundabout for the following turning movements:

- A249 southbound to M2 westbound;
- A249 northbound to M2 eastbound; and
- M2 eastbound to A249 northbound.

3.1.4 The existing Maidstone Road connection with Stockbury Roundabout will be stopped up and a new Maidstone Road link will be provided, connecting to Oad Street to the north of the M2.

3.1.5 A new link road will be provided between Stockbury Roundabout and Oad Street, with the new link road connecting into Oad Street near the existing junction of Oad Street and the A249. The existing Oad Street and A249 junction will be closed. Oad Street will remain open for local access to properties but will not have direct access onto the A249 as currently exists. The existing southbound lanes of the A249 will be retained south of the existing junction with Oad Street and this will be converted into a two-way single carriageway to provide continued access to properties and land fronting this section of road and connection to South Green Lane.

3.1.6 The Honeycrock Hill junction with the A249 will be stopped up and the existing junction with Church Hill will be amended to bring it in line with current highway standards. This will involve the removal of the existing U-turn facility, a change to the radii of both corners of the junction and a reconfiguration of the traffic islands.

Purpose and objectives

3.1.7 The M2 is an important motorway linking Rochester to Faversham, and a key route to the Port of Dover. Junction 5 of the M2 is the main access point for people travelling north east to Sittingbourne, the Isle of Sheppey and the Port of Sheerness, and south west to Maidstone and surrounding villages.

3.1.8 The purpose and objectives of the Scheme are to:

- Increase the capacity of the junction to support future growth in housing, employment and the economy;
- Improve safety for all users of the junction to reduce accident numbers;

- Improve reliability of journey times through the junction;
- Deliver a high standard of highway design that is in keeping with the local environment; and
- Minimise any adverse environmental impacts where feasible.

Physical land-take

3.1.9 The total works footprint of the scheme (the 'Scheme boundary') is approximately 40 ha comprising land within and adjacent to the existing highways boundary. All land-take for the Scheme will be within the Scheme boundary shown on Figure 1 (Appendix A). There will be no land-take from any European Sites, including North Downs Woodlands SAC.

Key stages of the project and timescales

3.1.10 The Orders (and supporting documentation including the preliminary design and ES) under the Highways Act 1980 were published in June 2019.

3.1.11 On 30 August 2019 the Department for Transport issued a notice of intention to hold a Public Inquiry into the Orders. The Public Inquiry is due to start 28 April 2020. Following the Public Inquiry, the Inspector will forward their recommendations to the Secretary of State who will announce their decision. This is expected around late Summer 2020.

3.1.12 Construction of the Scheme will start once a decision from the Secretary of State has been received. Site mobilisation, including construction compounds and site clearance, is currently proposed to be completed by March 2021. Environmental works, including the relocation of any ecological constraints identified prior to the start of works, is currently proposed to be undertaken up to the end of Spring 2021.

3.1.13 The main construction works will be completed in two phases. The first phase of works will be for works on Maidstone Road and Oad Street and the second phase will be the remainder of the works. The main works are anticipated to take approximately 30 months.

3.1.14 There will be a 5-year maintenance aftercare period for landscaping after which maintenance of junctions will remain largely with the current highways authorities (i.e. Kent County Council east of the M2 and Highways England to the west).

3.1.15 In view of the up to 120-year design life for structures, it is not considered appropriate for decommissioning to form part of the environmental assessment. The focus of the Scheme will be upon seeking to minimise disruption and reuse of materials which forms part of the materials assessment. Decommissioning of the Scheme has therefore not been included.

Resource requirements

3.1.16 The key materials and their estimated quantities associated with the construction of the Scheme are presented in Table 3.1 . The material estimates have been calculated from the preliminary design.

Table 3.1: Estimated material use during construction

Material	Estimated material use (tonnes)
Aggregate	345,708
Concrete	84,146
Asphalt	60,000
Recycled aggregate	151

3.1.17 Once built, the Scheme will not require any further resources apart from electricity to operate road signs and lighting, details of which are not available at this time.

3.1.18 The Scheme construction also involves habitat loss (*i.e.* the loss of ecological resources), however, due to the habitat creation measures that will be provided as part of the environmental mitigation design as described in the ES, long-term beneficial effects are anticipated once the created habitats have become established.

3.1.19 No resources will be extracted from North Downs Woodlands SAC.

Waste products arising during construction and operation

3.1.20 The construction of the Scheme will result in the generation of waste. This will mainly be soil, aggregate, asphalt and concrete. However, smaller quantities of waste that would be generated include metal, wood and vegetation as well as municipal waste and septic tank waste from the workforce. Where waste is not suitable for re-use on site it is required to be taken of site for potential re-use, recycling, recovery or disposal.

3.1.21 The quantity of construction, demolition and excavation waste, estimated during the preliminary design stage, is 423,936 tonnes. This was estimated at preliminary design stage assuming a worst-case scenario of no re-use of excavated material on site. This will be revised at detailed design stage.

3.1.22 Minimal waste is anticipated during operation.

Other services required

3.1.23 Existing services along the highway will need to be diverted. The diversions will largely occur within the scheme boundary. However, there will be some limited diversions outside of the Scheme boundary associated with two southern water pipelines, a UK Power Networks overhead line and underground cable and a BT underground line. These are reported in the Environmental Statement Addendum Volume 1 (Core Document B.5) Chapter 7.

HRA Screening

3.1.24 The full HRA Screening assessment is presented in the Amended HRA Stage 1 Screening Report (Environmental Statement Addendum Volume 2 – Appendix D.6 (Core Document B.5), a summary of which is provided below.

3.1.25 The Screening assessment was undertaken in accordance with HD 44/09[13], which was the current Highways England standards available at the time. HD 44/09 has

[13] Highways England (2009) DMRB Volume 11 Section 4 Part 1 (HD 44/09) Environmental assessment. Assessment of implications on European Sites. Assessment of implications (of highways and/or roads projects) on European Sites (including appropriate assessment)

subsequently been replaced with LA 115[14], but this does not alter the conclusions of the Screening assessment. Similarly, sensitivity testing of amended methods for air quality calculation in the amended standards on Air Quality (LA 105[15]) would not alter the conclusions of the HRA Screening.

3.1.26 Two European Sites were identified as requiring Screening for likely significant effects:

- North Downs Woodlands SAC; and
- Peter's Pit SAC.

3.1.27 In both cases, Screening was identified as being necessary under DMRB[16] and Natural England[17] criteria due to the sites being located within 200 m of the Affected Road Network (ARN)[18]. Medway Estuary and Marshes Special Protection Area (SPA) and Ramsar is also located within 200 m of the ARN, potential for likely significant effects were discounted.

3.1.28 No likely significant effects were identified for Peter's Pit SAC, either for the Scheme alone, or in combination with other plans and projects.

3.1.29 For North Downs Woodlands SAC, air quality modelling was undertaken to predict the contribution the Scheme will make to airborne NOx[19] concentrations and nitrogen deposition within the site. The relevant benchmark for assessing the effect of NOx in the air is known as the Critical Level. On a precautionary basis, this is regarded to be 30 µg/m^3 (annual mean) for all vegetation types in the UK[20]. The relevant benchmark for assessing the effect of nitrogen deposition is known as the Critical Load. Habitat-specific Critical Load values are published on the Air Pollution Information System (APIS) website[21]. Natural England advises that, where data are available, 1% of the Critical Level/Load should be used as the threshold for screening potential air quality effects on European Sites[22].

3.1.30 In this case, the air quality modelling predicts that the screening threshold would not be exceeded for nitrogen deposition (i.e. nitrogen deposition is predicted to be less than 1% of the Critical Load values for the relevant qualifying feature habitats). However, the Natural England screening threshold would be exceeded for airborne NOx, both for the Scheme alone, and in combination with other plans and projects.

3.1.31 Following consultation with Natural England, the Screening assessment concluded that an Appropriate Assessment would be undertaken to determine if the identified air quality effect pathway is likely to result in an adverse effect on the integrity of North Downs Woodland SAC.

3.1.32 The full Screening matrix is reproduced in Appendix B.

[14] Highways England (2019) LA 115 Sustainability and environment. Appraisal. Habitats regulations assessment. DMRB 11.4.1. Design manual for roads and bridges (DMRB). Read with HA IAN 141/2011.
[15] Highways England (2019) LA 105 Sustainability and environment, Air quality, Revision 0
[16] Highways England (2007) Design Manual for Roads and Bridges Volume 11 Section 3 Part 1 Air Quality
[17] NE Internal Guidance – Approach to Advising Competent Authorities on Road Traffic Emissions and HRAs V1.4 Final – June 2018.
[18] The Affected Road Network (ARN) has been defined in accordance with HA 207/07 as roads meeting any of the following criteria:
- Road alignment will change by 5 metres or more; or
- Daily traffic flows will change by 1,000 annual average daily traffic or more; or
- Heavy duty vehicle flows will change by 200 annual average daily traffic or more; or
- Daily average speed will change by 10 kilometres per hour or more; or
- Peak hour speed will change by 20 kilometres per hour or more.

[19] Nitrogen oxides that are most relevant for air pollution, namely nitric oxide and nitrogen dioxide (referred to as 'NOx')
[20] Air Pollution Information System (APIS). Online: http://www.apis.ac.uk/critical-loads-and-critical-levels-guide-data-provided-apis#_Toc279788054 [Accessed on 13/01/20].
[21] Air Pollution Information System (APIS). Online: http://www.apis.ac.uk/srcl [Accessed on 13/01/20].
[22] Natural England Internal Guidance - Approach to advising competent authorities on the assessment of road traffic emissions and HRAs V1.4 Final – June 2018

3.1.33 Note that the screening approach advised by Natural England does not align with Highways England's published standards for undertaking HRA (LA115), and Air Quality (LA 105) or their predecessors and Highways England will seek agreement with Natural England on this matter for the context of other projects.

C4. Protected sites potentially affected by the proposals

4.1 Physical area of the European Site

4.1.1 North Downs Woodlands SAC (EU code: UK0030225) comprises multiple units distributed along the southern slopes of the North Downs in Kent (Figure 1, Appendix A), covering a total area of 288.58 ha.

4.1.2 The closest part of the SAC is approximately 5.6 km south west of the Scheme and approximately 10 m from the closest point of the ARN, where the A249 climbs Detling Hill near Maidstone. This part of the SAC overlaps with Wouldham to Detling Escarpment SSSI.

4.2 Qualifying interests of the European Site

4.2.1 North Downs Woodlands SAC comprises mature beech forests and yew woods on steep slopes. The stands lie within a mosaic of scrub, other woodland types and areas of unimproved grassland on thin chalk soils. The beech and yew woodland is on thin chalk soils and where the ground flora is not shaded, dog's mercury predominates. Associated with it is stinking iris and several very scarce species such as lady orchid and stinking hellebore. The chalk grassland on south-facing slopes is dominated by upright brome and sheep's-fescue but supports many other plants which are characteristic of unimproved downland, including the nationally rare ground pine.

4.2.2 Qualifying interest features are as follows:

- Annex I habitats that are a primary reason for selection:
  - 91J0 Taxus baccata woods of the British Isles (yew-dominated woodland) (*Priority feature) – 66.1 ha of total site area;
  - 9130 Asperulo-Fagetum beech forests (beech forests on neutral to rich soils) – 53.1 ha of total site area; and
- Annex I habitats that are present as a qualifying feature but not a primary reason for selection:
  - 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (dry grasslands and scrublands on chalk or limestone) – 40.4 ha of total site area.

4.2.3 The yew dominated woodland represents 2-15% of the total UK area of this feature. The beech forests and calcareous grassland features are both less than 2%. North Downs Woodlands SAC is the most easterly site selected for yew-dominated woodland and beech forests.

4.2.4 There are no Annex II species qualifying features. However, the grassland habitats are of great entomological importance, supporting the only known UK population of the moth *Hypercallia citrinalis*, and several other very scarce species of moth, beetle and grasshopper.

4.2.5 The site notification information is presented in Appendix C.

4.3 Conservation objectives

4.3.1 Natural England has identified the following conservation objectives for North Downs Woodlands SAC[23]:

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

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

4.3.2 Relevant supplementary advice from Natural England[24] regarding maintenance/restoration of the *"supporting processes on which the qualifying natural habitats rely"* identifies the following target regarding air quality for the yew dominated woods and beech forest features:

> *"Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)."*

4.3.3 The concern in this case is in relation to nitrogen deposition, which is reported in the supplementary advice as being 25.9 kg N/ha/yr. This is above the Critical Loads identified for yew dominated woods (5-15 kg N/ha/yr) and beech forests (10-20 kg N/ha/yr).

4.3.4 For the calcareous grassland feature, the target is to 'maintain' the concentrations of air pollutants at or below the Critical Load or Level. This is because Nitrogen deposition is reported as being 15.3 kg N/ha/yr, which is between the Critical Load of 15-25 kg N/ha/yr identified for this feature.

4.3.5 No information has been found which suggests any published conservation initiatives for the site.

4.4 Details of existing baseline conditions

4.4.1 The area of the SAC close to the ARN where the increase in airborne NOx is predicted to be greater than 1% of the Critical Level (i.e. up to 81 m from the ARN) corresponds with Unit 26 of Wouldham to Detling Escarpment SSSI, also known as Lynch Bank. This unit has a total area of 4.08 ha. No specific field assessment work has been undertaken to inform this SIAA. The last SSSI condition assessment of this unit was undertaken by Natural England in April 2008[25], when it was recorded as being in Favourable condition and described as follows:

> *"Minimal intervention woodland on the slope with a canopy of yew, mature beech and oak. There is a varied understorey typical of the woodland type. The ground flora includes a good range of characteristic plants including dogs mercury, stinking iris, bluebell, spurge laurel. Sycamore is present but*

[23] Natural England (2018). European Site Conservation Objectives for North Downs Woodlands Special Area of Conservation.
[24] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features – North Downs Woodlands Special Area of Conservation (SAC).
[25] Natural England. Condition of SSSI Units for Site Wouldham to Detling Escarpment SSSI. Online: https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1001339&ReportTitle=Wouldham to Detling Escarpment SSSI [Accessed: 15/01/20]

does not appear to be causing adverse effects at present. There are adequate levels of natural tree regeneration."

4.4.2 It is concluded from this that both the yew dominated woodland and beech forests are both present as SAC qualifying features within 81 m of the ARN and that the calcareous grassland feature is not present. Aerial photography indicates fairly continuous woodland cover over this compartment which confirms this conclusion.

4.5 Value of the site and the qualifying interests therein to the European Site network

4.5.1 Information on the distribution and extent of qualifying interest features is taken from the JNCC website[26].

9130 Asperulo-Fagetum beech forest

4.5.2 9130 Asperulo-Fagetum beech forest is relatively abundant within its range in southern England and Wales on circumneutral to calcareous soils along the slopes of the major hill systems of the chalk and southern limestones. There are nine SACs with 9130 Asperulo-Fagetum beech forests as a primary qualifying feature (Grade A/B) and two more designated as having Grade C (a qualifying feature but not a primary reason for selection) these are all situated in the southern part of England and Wales. There are a further six SACs (two in south-east England and four in Wales) where the habitat is present but not as a qualifying feature (Grade D).

4.5.3 North Downs Woodland SAC is the most easterly site where the habitat is a qualifying feature (although there are two Grade D sites to the south-east of it). The importance of the 9130 Asperulo-Fagetum beech forests qualifying feature is therefore both as part of a wider network of the habitat type and as the eastern extent of the range.

91J0 Taxus baccata woods

4.5.4 91J0 Taxus baccata woods is a Priority interest feature. Yew Taxus baccata woodland occurs on shallow, dry soils usually on chalk or limestone slopes, but in a few areas stands on more mesotrophic soils are found. There are eleven SACs with 91J0 Taxus baccata woods as a primary qualifying feature (Grade A/B) and two more designated as having Grade C (a qualifying feature but not a primary reason for selection) these are situated (albeit sparsely) across England and Wales. There is one more SAC where the habitat is present but not as a qualifying feature (Grade D).

4.5.5 North Downs Woodland SAC is the most easterly site where the habitat is a qualifying feature. The importance of the 91J0 Taxus baccata woods qualifying feature is therefore both as part of a wider network of the habitat type and as the eastern extent of the range.

6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)

4.5.6 6210 Festuco-Brometalia grasslands occur widely on suitable substrates in England and Wales, but are much more restricted in Scotland and Northern

[26] www.jncc.gov.uk

Ireland. In the humid climate of the UK, orchids are nearly ubiquitous in calcareous grassland. 6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia), is a qualifying feature of 59 SACs (33 as primary reason for designation (Grade A/B) and 26 as a qualifying feature but not primary reason for site selection). These are distributed across the UK with the highest density in the southern half of England. There are approximately 21 more sites where the habitat is present but not as a qualifying feature (Grade D), with a similar distribution.

4.5.7 North Downs Woodland SAC is towards the south-east of the extent of the sites designated, although there are approximately 6 other sites further south-east. The importance of the 6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia), qualifying feature is therefore both as part of a wider network of the habitat type and as part of the south- eastern extent of the range.

4.6 Likely future baseline changes at the site in the absence of the project

4.6.1 The four main threats which have the potential to change the future baseline identified in the SAC designation Natural 2000 data form (copy in Appendix C) are:

- Invasive non-native species (I01);
- Forest and Plantation management & use (B02);
- Outdoor sports and leisure activities, recreational activities (G01); and
- Air pollution, air-borne pollutants (H04).

4.6.2 Relevant elements of these are also discussed in the supplementary advice document[27] and Site Improvement Plan[28]. Impacts relating to invasive non-native species are not considered relevant to this Scheme. Possible changes to future baseline are considered below.

Site management

4.6.3 No information has been found which directly identifies how site management may change in the future. However, in identifying those attributes in need of restoration, Natural England's supplementary advice document[29] and Site Improvement Plan[30] do provide an indication of the processes and activities that might drive future change in the absence of appropriate management intervention. None were identified for yew dominated woods, but the following were identified for beech forests:

- Regeneration potential – beech regeneration is currently insufficient to maintain canopy cover in the long term. In addition, beech saplings are susceptible to squirrel damage.

[27] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features – North Downs Woodlands Special Area of Conservation (SAC).
[28] Natural England (2014). Site Improvement Plan – North Downs Woodlands. Version 1 (22/12/14).
[29] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features – North Downs Woodlands Special Area of Conservation (SAC).
[30] Natural England (2014). Site Improvement Plan – North Downs Woodlands. Version 1 (22/12/14).

- Root zones damage – off-road vehicles and all-terrain bikes are compacting the soil structure within and around the root zones of the mature and ancient tree cohort in parts of the site.
- Spread of invasive species – sycamore is present in the woodland and has the potential to spread, altering the composition of the woodland and reducing the abundance and diversity of native species.

Air quality

4.6.4 As described above, Natural England's supplementary advice document for the site[31] specifically identifies that nitrogen deposition at the site currently exceeds the Critical Loads identified for yew dominated woods and beech forest (there is no mention of exceedance of NOx Critical Levels). Nitrogen deposition has the potential to alter the composition of the woodland plant communities, favouring those species which are able to more readily exploit the increased nitrogen levels, resulting in an overall decrease in species diversity. However, atmospheric nitrogen levels are currently declining and are expected to decrease further in the future, as emissions continue to decrease[32][33][34][35][36][37].

Climate change

4.6.5 There are numerous ways in which climate change may impact beech and yew woodlands. These include death of beech trees and changes in ground flora composition due to drought and spring waterlogging; increased survival of pest species due to warmer winters; increased loss of mature trees to wind blow; and increased prevalence of fungal pathogens[38].

4.6.6 Modelling studies indicate that climate change will cause a probable shift away from beech-dominated communities in the driest sites in south eastern England, with some scenarios indicating that the entire county of Kent will become inhospitable to beech[39]. It is predicted that this would result in a more dynamic mixture of more drought-tolerant species, such as oaks, whitebeam and yew[40]. However, the timescale over which such change may occur is not yet known.

4.7 Key ecological factors for maintaining site integrity

4.7.1 The key species, habitat dynamics and functional relationships for maintaining the integrity of the North Downs Woodlands SAC, with regard to its yew dominated woodland and beech forest features (as summarised from Natural England's

[31] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features – North Downs Woodlands Special Area of Conservation (SAC).
[32] Air Quality Expert Group (2004). Nitrogen dioxide in the United Kingdom. Department for the Environment, Food and Rural Affairs.
[33] Carslaw, D.C., Beevers, S.D. Westmoreland, E. Williams, M.L. Tate, J.E., Murrells, T. Stedman, J. Li, Y., Grice, S., Kent, A. and I. Tsagatakis (2011). Trends in NOx and NO^2 emissions and ambient measurements in the UK. Version: July 2011.
[34] RoTAP (2012). Review of Transboundary Air Pollution: Acidification, Eutrophication, Ground Level Ozone and Heavy Metals in the UK. Contract Report to the Department for Environment, Food and Rural Affairs. Centre for Ecology and Hydrology.
[35] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0.
[36] Department for the Environment, Food and Rural Affairs (Defra) (2019). Clean Air Strategy 2019.
[37] Air Quality Consultants Ltd (2020). Nitrogen oxides trends in the UK 2013 to 2019.
[38] Natural England & RSPB (2014). Climate Change Adaptation Manual – Evidence to support nature conservation in a changing climate. Part 2, Chapter 2: Beech and yew woodland.
[39] Wesche, S. (2003). The implications of climate change for the conservation of beech woodlands and associated flora in the UK. English Nature Research Report Number 528. English Nature, Peterborough.
[40] Wesche, S. (2003). The implications of climate change for the conservation of beech woodlands and associated flora in the UK. English Nature Research Report Number 528. English Nature, Peterborough.

supplementary advice on conserving and restoring the site's features[41]) are:

- Plant community composition characterised by the W13 *Taxus baccata* woodland National Vegetation Classification (NVC) type for the yew-dominated woodland feature and the W12 *Fagus sylvatica – Mercurialis perennis* woodland NVC type for the beech forest feature;
- Canopy cover typically in the range of 40-90%;
- Areas of open space totalling approx. 10% of the woodland area;
- Continuity and abundance of undisturbed old growth (at least 50% of area for yew dominated woods and 20% of the area for beech forest) and assemblages of veteran and ancient trees (typically >10 trees per hectare);
- Continuity and abundance of dead and decaying wood (typically 30-50 m^3/ha);
- Diversity of tree age class distribution;
- Presence of a sparse understorey under the yew dominated canopy;
- Graduation of the woodland edge into adjacent habitats;
- Presence of a diversity of site-native tree species;
- Browsing/grazing levels in the beech forest feature sufficient for woodland regeneration without excessive shading of the field layer;
- Potential for regeneration of desirable trees and shrubs;
- Dominance (95% cover) of site-native trees and shrubs;
- Presence of vascular plants including white mullein, stinking hellebore and lady orchid;
- Absence of invasive, non-native or introduced species; and
- Suitable soil properties (including structure, bulk density, total carbon, pH, soil nutrient status and fungal:bacterial ratio).

[41] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features – North Downs Woodlands Special Area of Conservation (SAC).

C5. Assessment methodologies and assumptions

5.1 Background

5.1.1 All available information about the Scheme was gathered in order to assess whether the Scheme is likely to have any significant effects on a European Site and, where necessary, any effects on site integrity. This included collation of air quality modelling data prepared for the ES.

Air quality modelling methods

5.1.2 NO_x concentrations were calculated within 200 m using the Advanced Dispersion Modelling System (ADMS) Roads dispersion model as described in the air quality chapter of the Scheme Environmental Statement. The following scenarios were considered:

- Base year 2016;
- Do-Minimum (DM) 2022; and
- Do-Something (DS) 2022.

5.1.3 For air quality, the opening year of the Scheme (2022) is likely to be the worst case scenario as vehicle emissions and background pollutant concentrations are anticipated to decrease over time.

5.1.4 The air quality assessment was based on traffic data supplied from a regional traffic model for the Scheme. The traffic model was developed in accordance with the Department for Transport's webTAG guidance, which takes into account traffic growth using National Trip End Model (NTEM) factors. It additionally takes into account traffic from other plans and projects from an extensive area around the M2 junction 5. The traffic data for the DM and DS scenarios already take into account traffic from other plans and projects, as discussed further in Section 5.4.

Significance criteria

5.1.5 The effects of elevated NOx concentrations on vegetation are summarised in Institute of Air Quality Management (IAQM) guidance[42] as follows:

- growth effects: particularly increased biomass, changes in root to shoot ratio and growth of more competitive species, but also including growth suppression of some species; and
- physiological effects: e.g. CO_2 assimilation and stomatal conductivity; and(bio)chemical effects: e.g. changes in enzyme activity and chlorophyll content (probably through the effects of increased nitrogen, as demonstrated in lichens, but also documented in higher plants).

5.1.6 IAQM guidance indicates that the long term (annual average) Critical Level for NOx is 30 µg/m^3. The long-term Critical Level for NOx was set on the basis that growth effects are likely to affect vegetation diversity and survival and occur at lower annual average concentrations than other effects. It is a precautionary general threshold, not specific to a particular habitat, plant species or impact pathway, below which there is currently a high degree of confidence that no adverse effects on vegetation will arise. Long term NOx concentrations below the Critical Level are

[42] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0

therefore desirable. Some species or habitats may not show adverse effects until higher concentrations are present[43].

5.2 Mitigation

5.2.1 No direct mitigation is proposed in relation to any potential effect pathway being considered in this SIAA (NOx effects on North Downs Woodland SAC).

5.2.2 The following summary of mitigation measures proposed to mitigate other potential biodiversity impacts (not directly relating to European Sites) of the scheme is taken from the HRA Stage 1 Screening document[44] and is included for completeness:

5.2.3 The risk of pollution during construction will be reduced by the adoption of good working practices, such as Guidance for Pollution Prevention (GPPs). In general terms, by following these guidelines, significant impacts to the water environment should be avoided.

5.2.4 In terms of construction dust, best practice mitigation measures would minimise any construction dust effects. Such measures may include but not necessarily be limited to:

- Regular water-spraying and sweeping of unpaved and paved roads to minimise dust and remove mud and debris;
- Using wheel washes, shaker bars or rotating bristles for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads;
- Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;
- Enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion;
- Ensuring any temporary site roads are no wider than necessary to minimise their surface area;
- Damping down of surfaces prior to their being worked; and
- Storing dusty materials away from site boundaries and in appropriate containment (e.g. sheeting, sacks, barrels etc.).

5.2.5 Mitigation measures incorporated into the Scheme in relation to protected or notable habitats or species include:

- Optimal timing of works to avoid key periods for particular species, such as avoidance of the bird nesting season for habitat clearance;
- Displacement of dormice from within suitable habitat within the Scheme footprint, enhancement of retained dormouse habitat and creation of new woodland and scrub habitat for dormice to mitigate for any habitat loss and enhance connectivity for dormice within the wider area;

[43] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0
[44] M2 Junction 5 Improvements Environmental Statement Addendum, Volume 2 – Appendix D.6 Amended Habitats Regulations Assessment Stage 1 Screening, January 2020

- Habitat creation and enhancement of existing habitat to compensate for loss of woodland habitats and hedgerows in particular, and to enhance habitat connectivity for species such as dormice and bats;
- Translocation and/or exclusion/displacement of reptiles, dormice and bats (under appropriate licences/agreements) from defined areas of the scheme to pre-prepared receptor sites (where necessary) to minimise impacts of habitat loss and species mortality;
- Appropriate design and use of lighting to minimise impacts on bats and other light sensitive species; and
- Implementation of general construction environmental best practice including, providing tool box talks for construction staff informing them of key ecological constraints within the area, and ensuring that open trenches are not left over night without safe means of egress for animals that may fall into them.

5.2.6 Avoidance and mitigation measures will be located in relevant areas within the Scheme boundary.

5.2.7 The standard pollution prevention measures to be implemented are proven to be effective in minimising the risk of pollution.

5.2.8 Other proposed mitigation measures are also plainly established and uncontroversial and follow relevant best practice guidelines.

5.2.9 Detailed avoidance and mitigation measures will be implemented as part of appropriate Construction Method Statements and Construction Environmental Management Plans, in accordance with standard best practice and Design Manual for Roads and Bridges requirements. These documents will form the basis for contractual obligations of the main works contractor, and thus are considered robust mechanisms for delivery.

5.3 Alternative solutions

5.3.1 The Scheme has been through a thorough option selection and identification process (detailed in the Chapter 3 of the ES Volume 1 (Core Document B.1)) based on a staged approach that begun in 2009. All options have been assessed in terms of their technical feasibility, safety, engineering, value for money and environmental considerations.

5.3.2 During the option stage, twelve options were initially reviewed. Of these twelve options, nine options were discounted, because they were considered unlikely to deliver significant positive effects in terms of relieving congestion, reducing queuing and improving local connectivity.

5.3.3 This left three options, referred to as Option 4, 10 and 12. Additional options were also identified and referred to as Option 12A and Option 12A Oad Street Alignment Route B. All six options were further reviewed and assessed and four of the options discounted from further consideration based on cost, capacity performance and impacts on Chestnut Ancient Woodland.

5.3.4 Option 12A Oad Street Alignment Route B was selected as the preferred option to take to public consultation in September and October 2017 as this option achieved the Scheme objectives, avoided the need to remove Ancient Woodland and fell within the budget allocated for the Scheme.

5.3.5 The response to consultation resulted in a revised Option 12A being developed to

address concerns, including those raised by the Kent Downs AONB, regarding the intrusive nature of the Oad Street Link alignment. Further feedback during public consultation indicated strong support for the reconsideration of Option 4. As a result, a variant called Option 4H1, the current Scheme, was developed and considered to perform the best against the Scheme objectives. The preferred route announcement was in May 2018.

5.4 In-combination assessment

5.4.1 The Habitats Regulations requires Appropriate Assessment to consider impacts on integrity from the Scheme 'in combination' with other projects and plans.

5.4.2 The effects of the Scheme in combination with other plans or projects are the cumulative effects which will or might result from the addition of the effects of other relevant plans or projects to the effects of the Scheme.

5.4.3 The Habitats Regulations Handbook[45] advises that any plans or projects at the following stages may be relevant to an in-combination assessment:

- Applications lodged but not yet determined;
- Projects subject to periodic review e.g. annual licences, during the time that their renewal is under consideration;
- Refusals subject to appeal procedures and not yet determined;
- Projects authorised but not yet started;
- Projects started but not yet completed;
- Known projects that do not require external authorisation;
- Proposals in adopted plans; and
- Proposals in finalised draft plans formally published or submitted for final consultation, examination or adoption.

5.4.4 A search was undertaken of local authority planning webpages for relevant planning applications and consents, as well as a review of allocated and proposed sites in local plans. In addition, the relevant Local Planning Authorities (Swale Borough Council and Maidstone Borough Council) were consulted to determine whether any other developments in the vicinity of the scheme should be taken into consideration and when they believe these to be likely to come forward.

5.4.5 The air quality assessment includes consideration of committed development in order that an in-combination assessment can be undertaken.

5.4.6 The other committed development projects which were considered, included the A289 Four Elms Roundabout to Medway Tunnel, New Medway Crossing, M20 Junction 4 Eastern Overbridge Widening, A20 Coldharbour Roundabout, A26 Tonbridge Road/Fountain Lane, Maidstone Major Infrastructure Improvement, Maidstone Bridge Improvement Scheme, A229 Loose Road/Armstrong Road/ Park Way, A229 Loose Road/A274 Sutton Road (Wheatsheaf), and Linton Crossroads.

[45] Tyldesley, D., and Chapman, C., (2013) The Habitats Regulations Assessment Handbook, January 2018 edition UK: DTA Publications Limited www.dtapublications.co.uk .

C6. Potential impacts on protected sites: North Downs Woodlands SAC

6.1 Where the impact directly or indirectly affects the site

6.1.1 The only impact pathway identified as resulting in a likely significant effect is the increase in atmospheric NOx levels from the ARN associated with the Scheme, both alone and in-combination with other plans and projects.

6.1.2 This impact pathway has been identified by application of the '1% of Critical Level' screening threshold test recommended by Natural England guidance[46]. It is important to note that the same guidance states that the 1% threshold should not be used for determining whether there is an adverse effect on site integrity during Appropriate Assessment.

6.1.3 The HRA Stage 1 Screening assessment for the scheme did not identify any potential for any effects via other impact pathways, as listed below:

- Physical land take;
- Disturbance to key species;
- Habitat or species fragmentation; and
- Reduction in species density.

6.2 Loss of Area of European Site

6.2.1 There will be no land take within the North Downs Woodland SAC (or any other European Site).

6.3 Change in species population numbers of qualifying interests

Air quality modelling results

6.3.1 The relevant results of the air quality modelling with regard to NOx and North Downs Woodlands SAC are presented below in Table 5.1. The modelling is based on two scenarios, which were also used for the air quality assessment in the ES:

- Do Minimum – other committed developments but no Scheme; and
- Do Something – Scheme plus other committed developments.

6.3.2 The results show that the annual mean NOx Critical Level for all vegetation types (30 µg/m^3) is predicted to be exceeded up to 61 m from the ARN where the ARN is closest to the SAC (the closest edge of the SAC boundary is between approximately 5 m and 30 m from the ARN). The contribution of the Scheme alone to these values is predicted to be 1 µg/m^3 at a distance of 11 m from the ARN, declining with distance from the ARN.

[46] Natural England (2018) NEA001 Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations Version: June 2018

Table 6.1: Modelled annual mean NOx values during the base year (2016) and the opening year of the Scheme (2022) for 'Do Minimum' and 'Do Something' scenarios

Distance from ARN (A249 at Detling Hill)	Predicted NOx Level in Base Year (2016) (µg/m^3)	Predicted NOx Level in 2022 (µg/m^3)		Contribution of Scheme Alone (DS – DM)
		Do Minimum (DM)	Do Something (DS)	
11 m	71.2	52.2	53.2	1.0
16 m	62.8	46.1	46.9	0.8
21 m	56.9	41.8	42.6	0.8
26 m	52.6	38.6	39.3	0.7
31 m	49.2	36.2	36.8	0.6
41 m	44.4	32.6	33.1	0.5
51 m	40.9	30.1	30.6	0.5
61 m	38.4	28.3	28.7	0.4

6.3.3 The distance bands used for the air quality modelling are shown in relation to the SAC boundary in Figure 1 (Appendix A). The area of the SAC that would experience an exceedance of the NOx critical level is estimated to be approximately 0.99 ha (equivalent to 0.34% of the total site area). It is also worth noting that the point at which the 30 µg/m^3 exceedance extends to is somewhere between the 51 m and 61 m distance band for both the Do Minimum and Do Something scenarios. Indicating that any increase in the area of the exceedance is minimal, perhaps 5 m.

6.3.4 It is important to note that the actual area affected is likely to be smaller than the results suggest, as the air quality modelling does not take account of topography. The A249 is cut into a steep embankment where it passes closest to the SAC. In reality, NOx levels would decline with height as well as distance from the ARN, meaning that the extent of the Critical Level exceedance is likely to be less than that indicated by the air quality modelling.

NOx Trends

6.3.5 There is clear evidence that UK NOx emissions, including those from road traffic, are declining and will continue to do so in the future[474849505152]. This decline is largely attributable to improvements in vehicle emissions despite an increase in the overall number of vehicle journeys.

6.3.6 The wider UK trend is reflected in the air quality modelling results for the Scheme, which show a decrease in NOx levels at all modelled locations between the base year (2016) and the opening year (2022). For example, at the location within the

[47] Air Quality Expert Group (2004). Nitrogen dioxide in the United Kingdom. Department for the Environment, Food and Rural Affairs.
[48] Carslaw, D.C., Beevers, S.D. Westmoreland, E. Williams, M.L. Tate, J.E., Murrells, T. Stedman, J. Li, Y., Grice, S., Kent, A. and I. Tsagatakis (2011). Trends in NOx and NO^2 emissions and ambient measurements in the UK. Version: July 2011.
[49] RoTAP (2012). Review of Transboundary Air Pollution: Acidification, Eutrophication, Ground Level Ozone and Heavy Metals in the UK. Contract Report to the Department for Environment, Food and Rural Affairs. Centre for Ecology and Hydrology.
[50] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0.
[51] Department for the Environment, Food and Rural Affairs (Defra) (2019). Clean Air Strategy 2019.
[52] Air Quality Consultants Ltd (2020). Nitrogen oxides trends in the UK 2013 to 2019.

SAC which is 11 m from the ARN, annual mean NOx levels are predicted to drop from 71.2 µg/m^3 to 53.2 µg/m^3 (including the contribution from the Scheme). There is reason to believe that the decrease may be underestimated in the air quality model. This is because the fleet turnover model which feeds into the air quality model does not reflect recent developments in national policy or vehicle purchasing trends[53].

6.3.7 In the context of the observed and modelled downward trend in NOx levels, as well as the UK Government's Clean Air Strategy[54], which sets out the mechanisms by which a 73% reduction in NOx levels will be achieved by 2030 (compared to a 2005 baseline), it is likely that the magnitude and extent of the predicted Critical Level exceedance will decrease with time and may potentially be lower than predicted when the Scheme is opened. Either way, the predicted contribution of NOx from the Scheme will be negligible in comparison to the prevailing trend of decreasing NOx levels.

Sensitivity of Qualifying Features

6.3.8 The Natural England assessment of Unit 26 of Wouldham to Detling Escarpment SSSI[55] states: 'This is minimal intervention woodland on the slope with a canopy of yew, mature beech and oak. There is a varied understorey typical of the woodland type. The ground flora includes a good range of characteristic plants including dogs mercury, stinking iris, bluebell, spurge laurel. Sycamore is present but does not appear to be causing adverse effects at present. There are adequate levels of natural tree regeneration.' For the purposes of this assessment, it is therefore assumed that the two woodland qualifying features of North Downs Woodlands SAC (Taxus baccata woods of the British Isles and Asperulo-Fagetum beech forests) are present within the compartment that will experience increased NOx levels associated with the Scheme. The calcareous grassland qualifying feature does not appear to be present. This is supported by analysis of aerial imagery and map data on the MAGIC website (https://magic.defra.gov.uk/), which indicates that habitats within North Downs Woodlands SAC within 200 m of the ARN comprise woodland.

6.3.9 The North Downs Woodlands SAC was first selected as having habitats of qualifying interest for SAC designation in 2001 and designation was completed in 2005 (see Appendix C), the underlying SSSI[56] has been afforded protection since 1951 and was designated as a SSSI in 1981. At the point of SAC designation (2001-2005), atmospheric NOx would have been above the 2016 baseline levels within the affected compartment as there has been a general reduction in atmospheric NOx concentrations[57][58][59][60][61].

6.3.10 The condition assessment identified that Unit 26 was in Favourable condition in

[53] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0.
[54] Department for the Environment, Food and Rural Affairs (Defra) (2019). Clean Air Strategy 2019.
[55] Natural England. Condition of SSSI Units for Site Wouldham to Detling Escarpment SSSI. Online: https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1001339&ReportTitle=Wouldham to Detling Escarpment SSSI [Accessed: 15/01/20]
[56] Wouldham to Delting SSSI – citation: https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001339.pdf
[57] Air Quality Expert Group (2004). Nitrogen dioxide in the United Kingdom. Department for the Environment, Food and Rural Affairs.
[58] Carslaw, D.C., Beevers, S.D. Westmoreland, E. Williams, M.L. Tate, J.E., Murrells, T. Stedman, J. Li, Y., Grice, S., Kent, A. and I. Tsagatakis (2011). Trends in NOx and NO^2 emissions and ambient measurements in the UK. Version: July 2011.
[59] RoTAP (2012). Review of Transboundary Air Pollution: Acidification, Eutrophication, Ground Level Ozone and Heavy Metals in the UK. Contract Report to the Department for Environment, Food and Rural Affairs. Centre for Ecology and Hydrology.
[60] Institute of Air Quality Management (IAQM) (2019). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0.
[61] Air Quality Consultants Ltd (2020). Nitrogen oxides trends in the UK 2013 to 2019.

2008 (and at all previous condition assessments – 1997. 2003, 2004). This is despite the fact that this woodland unit has been located in close proximity to the A249 since its construction in the 1960s. Based on the NOx trend described above, between the 1960s and 2008, the habitat within Unit 26 is likely to have been exposed to NOx levels well above the Critical Level and higher than the levels predicted for the opening year of the Scheme. Nevertheless, the condition was assessed as Favourable.

6.3.11 The Favourable condition assessment does not necessarily equate to the absence of any NOx effects. However, it does provide a strong indication that the NOx levels predicted for the opening year of the Scheme, which are likely to be substantially lower than those of previous years under all scenarios, will not cause the kind of changes in habitat structure and function necessary to undermine the integrity of the qualifying features of the SAC.

Conclusion

6.3.12 In its opening year (2022), the Scheme is predicted to make a contribution of up to 1 µg/m^3 to an exceedance of the NOx Critical Level, which would apply to up to 0.34% of the total area of the North Downs Woodlands SAC, although the modelling does not account for topography which could reduce this further. It is considered unlikely that a change to such a small proportion of the site would adversely affect its integrity, even if the change involved substantial degradation or loss of the habitats in this area. In this case, no such habitat degradation or loss is anticipated.

6.3.13 While the Critical Level is still likely to be exceeded in at least part of the 0.34% area, there is a background trend of decreasing NOx levels. As a result, the predicted NOx levels are substantially lower than those estimated for 2016 and in previous years. Furthermore, the integrity of the SAC's qualifying woodland habitat features does not appear to have been adversely affected by exposure to the past exceedances of the NOx Critical Level, which are greater than those predicted for when the Scheme is operational.

6.3.14 Therefore, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC. As such, it is concluded that there will be no adverse effect on site integrity.

6.4 Disturbance to species within European Site

6.4.1 All of the qualifying features for North Downs Woodland SAC are Annexe 1 habitats, therefore disturbance impacts can be discounted.

6.5 Effects of fragmentation caused by the Scheme

6.5.1 The Scheme will not result in any direct loss of habitats within the North Downs Woodland SAC that could cause fragmentation. All of the qualifying features for North Downs Woodland SAC are Annexe 1 habitats, therefore fragmentation effects remote from the designation are negligible and can be discounted.

6.6 The reversibility or the impacts

6.6.1 Any effects resulting in alteration or species composition or extent of qualifying interest habitats would in theory be reversible over the long term with an improvement in air quality.

6.7 The duration of the effects

6.7.1 The impacts from traffic use of the Scheme are during the operational phase of the Scheme and therefore in effect permanent, not-withstanding any long-term change in vehicle-type reductions in traffic related emissions.

6.8 Integrity of European Site checklist

6.8.1 The integrity checklists are below are taken from tables C.1 and C.2 of 'Appendix C' of LA 115[62]. Traffic and air quality modelling takes account of future trends in traffic and therefore conclusions below are both alone and in-combination with traffic from other projects.

Table 6.2: Conservation objectives (From LA 115 Table C.1)

Does the Scheme have the potential to:	
1) cause delays in progress towards achieving the conservation objectives of the site?	Although impacts resulting from the pathway have the potential to cause delays in achieving conservation objectives for the site, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
2) interrupt progress towards achieving the conservation objectives of the site?	Although impacts resulting from the pathway have the potential to interrupt progress in achieving conservation objectives for the site, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
3) disrupt those factors that help to maintain the favourable conditions of the site?	Although impacts resulting from the pathway have the potential to disrupt maintenance of favourable conditions of the site, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
4) interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	Although impacts resulting from the pathway have the potential to interfere with the balance, distribution and density of key species, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.

Table 6.3: Other indicators (From LA 115 table C.2)

Does the Scheme have the potential to:	
1) cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Although impacts resulting from the pathway have the potential to change aspects of site function, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
2) change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	Although impacts resulting from the pathway have the potential to change the dynamics of site function, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
3) interfere with predicted or expected natural changes to	No, the effect pathway will not interfere with any changes on the site.

[62] Highways England (2019) LA 115 Sustainability and environment. Appraisal. Habitats regulations assessment

Does the Scheme have the potential to:	
the site (such as water dynamics or chemical composition)?	
4) reduce the area of key habitats?	Although impacts resulting from the pathway have the potential to cause long term change in vegetation and therefore habitat types, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
5) reduce the population of key species?	North Downs Woodlands SAC is designated for habitats, therefore this impact pathway is not relevant (changes in vegetation composition are discussed in row 4).
6) change the balance between key species?	North Downs Woodlands SAC is designated for habitats, therefore this impact pathway is not relevant (changes in vegetation composition are discussed in row 4).
7) reduce the diversity of the site?	Although impacts resulting from the pathway have the potential to cause long term change in vegetation which could result in long term reduction in species composition and diversity, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.
8) result in disturbance that could affect population size or density of the balance between key species?	North Downs Woodlands SAC is designated for habitats, therefore this impact pathway is not relevant (changes in vegetation composition are discussed in row 4).
9) result in fragmentation?	No, there will be no direct land take which could result in fragmentation
10) result in loss or reduction of key features (e.g tree cover, tidal exposure, annual flooding etc.)?	Although impacts resulting from the pathway have the potential to cause long term change in vegetation and therefore habitat types, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC and therefore this effect is discounted.

C7. Mitigation

7.1.1 No mitigation measures are proposed for North Downs Woodlands SAC.

7.1.2 A summary of other mitigation is provided for context in section 5.2 of this SIAA.

C8. Proposals for monitoring and reporting

8.1.1 This SIAA concludes that the extent and severity of any air quality impacts on North Downs SAC are negligible and adverse effects on the integrity of the site can be discounted. Therefore, no future monitoring of emissions or SAC habitat conditions are proposed.

C9. Consultations

9.1.1 Natural England provided responses to the HRA Stage 1 Screening for the Scheme, and comments were taken into account in an amended version of the HRA Screening document published in January 2020[63]. Full details of the screening consultation are provided in the HRA Screening document. Due to the effect pathway considered in this SIAA being identified late in the assessment process, Natural England have not provided any formal comments on this SIAA but have provided informal guidance on expectations for assessment.

9.1.2 It is anticipated that Natural England will provide comments on this published SIAA.

[63] M2 Junction 5 Improvements Environmental Statement Addendum, Volume 2 – Appendix D.6 Amended Habitats Regulations Assessment Stage 1 Screening, January 2020

C10. Conclusions

10.1.1 In its opening year (2022), the Scheme is predicted to make a contribution of up to 1 µg/m^3 to an exceedance of the NOx Critical Level, which would apply to up to 0.34% of the total area of the North Downs Woodlands SAC. It is considered unlikely that a change to such a small proportion of the site would adversely affect its integrity, even if the change involved substantial degradation or loss of the habitats in this area. In this case, no such habitat degradation or loss is anticipated.

10.1.2 While the Critical Level is still likely to be exceeded in at least part of the 0.34% area, there is a background trend of decreasing NOx levels. As a result, the predicted NOx levels are substantially lower than those estimated for 2016 and in previous years. Furthermore, the integrity of the SAC's qualifying woodland habitat features does not appear to have been adversely affected by exposure to the past exceedances of the NOx Critical Level, which are greater than those predicted for when the Scheme is operational.

10.1.3 Therefore, the Scheme is predicted to have a negligible effect on an insignificant proportion of the North Downs Woodlands SAC. As such, it is concluded that there will be no adverse effect on site integrity.

C11. References

Air Pollution Information System (APIS; http://www.apis.ac.uk/).

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Air Quality Expert Group (2004). Nitrogen dioxide in the United Kingdom. Department for the Environment, Food and Rural Affairs.

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Highways England (2019) LA 105 Sustainability and environment, Air quality, Revision 0

Highways England (2019) LA 115 Sustainability and environment. Appraisal. Habitats regulations assessment

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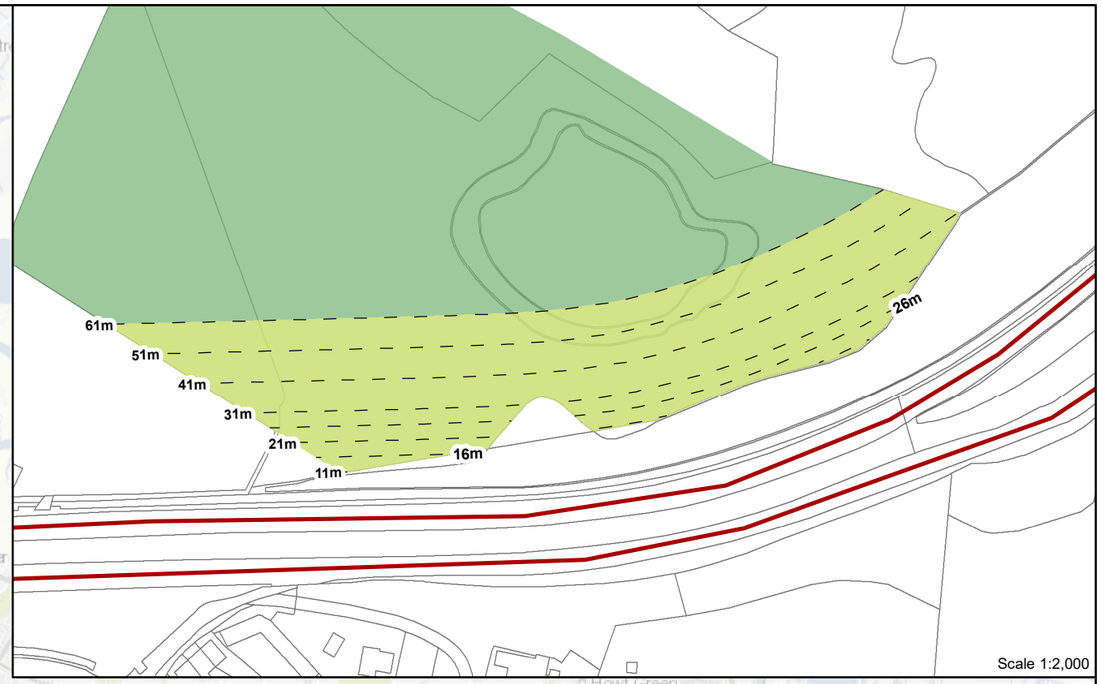
Appendices

Appendix A. Figures



See Inset Map

Kilometres
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LEGEND

- Scheme Boundary
- North Downs Woodlands Special Area of Conservation (SAC)
- Other Special Area of Conservation (SAC) Sites
- Area of North Downs Woodlands Special Area of Conservation (SAC) within 61m of Affected Road Network - 0.988 Ha
- Distance from Affected Road Network
- Affected Road Network

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

Construction
None

Maintenance / Cleaning
None

Use
None

Decommission / Demolition
None

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1	C01	SD	JC	LS	HC	17/05/19

Drawing Suitability: PUBLISHED
Status: A1

Project Title: ROAD IMPROVEMENT PROGRAMME
M2 Junction 5

Drawing Title: FIGURE 1
ASESSMENT OF AIR QUALITY IMPACTS ON NORTH DOWNS WOODLANDS SAC

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Drawing Number: HE551521 - ATK - EBD | XX - GS - GI - 000019
(Project | Originator | Volume; Location | Type | Role | Number)

Original Size:	Scale	Project Ref. No:	Sheet:	Rev:
A3	1:80,000	---	1 of 1	C01

Appendix B. North Downs Woodlands SAC screening matrix

North Downs Woodlands SAC Screening Matrix		
Project Name	M2 Junction 5 Improvements Scheme	
Natura 2000 Site under Consideration	North Downs Woodlands SAC	
Date:	Author (Name/Organisation):	Verified (Name/Organisation)
February 2019	Lizzie Hall Atkins	Matthew Bowell Atkins
Description of Project Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
Size and scale (road type and probable traffic volume)	The objectives of the Scheme are to: • Increase the capacity of the junction to support future growth in housing, employment and the economy; • Improve safety for all users of the junction to reduce accident numbers; • Improve reliability of journey times through the junction; • Deliver a high standard of highway design that is in keeping with the local environment; and • Minimise any adverse environmental impacts where feasible. The Scheme is located 58 km from the centre of London, 5 km north east of Sittingbourne. The M2 is an important motorway linking Rochester to Faversham, and a key route to the Port of Dover. Junction 5 of the M2 is the main access point for people travelling northeast to Sittingbourne, the Isle of Sheppey and the Port of Sheerness, and southwest to Maidstone and surrounding villages. The proposed Junction 5 improvements involve the replacement of the existing Stockbury Roundabout with a new grade-separated junction. Stockbury Roundabout would remain at-grade and would be enlarged to accommodate connections to the roundabout. The A249 mainline would flyover the Stockbury Roundabout, with the approaches on embankments and retaining walls, and with two single span bridges over the roundabout. Four new slip roads will be provided, three of which include dedicated left turn lanes at the roundabout for the following turning movements: • A249 southbound to M2 westbound; • A249 northbound to M2 eastbound; and • M2 eastbound to A249 northbound. The existing Maidstone Road connection with Stockbury Roundabout will be stopped up and a new Maidstone Road link will be provided, connecting to Oad Street to the north of the M2. A new link road will be provided between Stockbury Roundabout and Oad Street, with the new link road connecting into Oad Street near the existing junction of Oad Street and the A249. The existing Oad Street and A249 junction would be closed. Oad Street will remain open for local access to properties but will not have direct access onto the A249 as currently exists. The existing southbound lanes of the A249 will be retained south of the existing junction with Oad Street and this will be converted into a two-way single carriageway to provide continued access to	

North Downs Woodlands SAC Screening Matrix	
	properties and land fronting this section of road and connection to South Green Lane. The Honeycrock Hill junction with the A249 will be stopped up. Road types and anticipated traffic volumes: The A249 and M2 are both two lane dual carriageways on approach to the M2 Junction 5. The junction options are expected to result in projected traffic volumes of between approximately 74,000 and 75,000 vehicles per day north of the M2 Junction 5 on the A249 and between 58,000 and 60,000 vehicles per day south of the M2 Junction 5 on the A249 (Annual Average Daily Traffic) in the year 2041. Projected traffic volumes along the M2 are between 85,000 and 86,000 vehicles per day to the west of the M2 Junction 5 and between 73,000 and 74,000 vehicles per day to the east of the M2 Junction 5 (Annual Average Daily Traffic) in the year 2041.
Land-take	The Scheme would not require land-take from the North Downs Woodlands SAC.
Distance from the European Site or key features of the site (from edge of the project assessment corridor)	The North Downs Woodlands SAC is approximately 7 km south west of the scheme; and approximately 10 m from the closest point of the Affected Road Network (ARN)[64].
Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)	The Scheme does not require resources from the North Downs Woodlands SAC.
Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)	There is no hydrological link between the Scheme and the North Downs Woodlands SAC, and therefore no impact pathway by which any water-borne pollution generated by the Scheme could give rise to adverse effects on the European designated site. Road traffic is a source of nitrogen oxides (NOx emissions), a pollutant that can have adverse effects on plants and habitats as a result of nitrogen deposition which can cause nutrient enrichment of the soil and changes to the soil pH. This can have adverse effects on sensitive habitats. With regard to potential risks from road traffic emissions, Natural England and Highways England (HE) are in agreement that protected sites falling within 200 m of the edge of a road affected by a plan or project need to be considered further[65]. Given that North Downs Woodlands SAC is located within 200 m of the ARN, and given that all of the qualifying habitats are sensitive to air pollution according to the UK's Air Pollution Information System website (APIS, http://www.apis.ac.uk), the Natura 2000 Standard Data form and Site Improvement Plan for North Downs Woodlands SAC, this is considered to represent a potential impact pathway.

[64] Affected Road Network (ARN) - the affected road network has been defined in accordance with HA 207/07 scoping criteria as set out in the Design Manual for Roads and Bridges Section 3 Part 1 (HA207/07), former Highways Agency, May 2007. Affected roads are those that meet any of the following criteria:
— Road alignment will change by 5 metres or more; or
— Daily traffic flows will change by 1,000 annual average daily traffic or more; or
— Heavy duty vehicle flows will change by 200 annual average daily traffic or more; or
— Daily average speed will change by 10 kilometres per hour or more; or
— Peak hour speed will change by 20 kilometres per hour or more.

[65] Natural England Internal Guidance - Approach to advising competent authorities on the assessment of road traffic emissions and HRAs V1.4 Final – June 2018

North Downs Woodlands SAC Screening Matrix	
Excavation requirements (e.g. impacts of local hydrogeology)	Material will be generated as the result of new and modified highway earthworks and the excavation of drainage features. The majority of excavated material will be topsoil and sub soil to allow imported fill to be placed to extend/widen existing embankments.
Transportation requirements	Deliveries will be routed via the M2/M20/A249. The exception will be aggregates, asphalt and concrete. Local roads will not be used as delivery routes. The majority of construction traffic will come from the north along the M2 or from local quarries which are located around the M20. The number of HGVs and other traffic travelling to site are anticipated to be 20-50 HGV deliveries each day. It is expected that approximately 6 HGV will be working around the junction each day, moving material, plant etc. It is not anticipated that haul roads will be required to move material from one area on site to another. Given the distance of the North Downs Woodlands SAC from the Scheme and that the majority of construction traffic will come from the north along the M2 and the SAC is located to the south-west, transportation requirements during the construction phase are considered unlikely to have a significant adverse effect on the features for which the SAC is designated.
Duration of construction, operation, etc	Construction of the Scheme is currently programmed to commence in early 2020 and is expected to take approximately 18 months. The project would be operational for approximately 120 years in accordance with the design life for such carriageways.
Other	N/A
Description of avoidance and/or mitigation measures Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on: It should be noted that: the implication of the Court of Justice of the European Union (CJEU) judgement in relation to People over Wind (Peter Sweetman v Coillte Teoranta, Case C-323/17) is that competent authorities cannot take account of any integrated or additional avoidance or reduction measures when considering at the HRA screening stage whether the plan or project is likely to have an adverse effect on a European Site. The screening stage must be undertaken on a precautionary basis with no regard to any proposed integrated or additional avoidance or reduction measures. Where the likelihood of significant effects cannot be excluded on the basis of objective information, the competent authority must proceed to carry out an Appropriate Assessment to establish whether the plan or project will affect the integrity of the European Site, which can include at that stage consideration of the effectiveness of the proposed avoidance or reduction measures. This is outlined in PINS Note 05/2018.	
Nature of proposals	The risk of pollution during construction will be reduced by the adoption of good working practices, such as Guidance for Pollution Prevention (GPPs)[66]. In general terms, by following these guidelines, significant impacts to the water environment should be avoided. In terms of construction dust, best practice mitigation measures would minimise any construction dust effects. Such measures may include but not necessarily be limited to: • Regular water-spraying and sweeping of unpaved and paved roads to minimise dust and remove mud and debris; • Using wheel washes, shaker bars or rotating bristles for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads; • Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;

[66] Guidance for Pollution Prevention (GPPs). GPPs provide environmental good practice guidance for the whole UK. http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/

North Downs Woodlands SAC Screening Matrix	
	• Enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion; • Ensuring any temporary site roads are no wider than necessary to minimise their surface area; • Damping down of surfaces prior to their being worked; and • Storing dusty materials away from site boundaries and in appropriate containment (e.g. sheeting, sacks, barrels etc.). Mitigation measures incorporated into the Scheme in relation to protected or notable habitats or species include: • Optimal timing of works to avoid key periods for particular species, such as avoidance of the bird nesting season for habitat clearance; • Displacement of dormice from within suitable habitat within the Scheme footprint, enhancement of retained dormouse habitat and creation of new woodland and scrub habitat for dormice to mitigate for any habitat loss and enhance connectivity for dormice within the wider area; • Habitat creation and enhancement of existing habitat to compensate for loss of woodland habitats and hedgerows in particular, and to enhance habitat connectivity for species such as dormice and bats; • Translocation and/or exclusion/displacement of reptiles, dormice and bats (under appropriate licences/agreements) from defined areas of the scheme to pre-prepared receptor sites (where necessary) to minimise impacts of habitat loss and species mortality; • Appropriate design and use of lighting to minimise impacts on bats and other light sensitive species; and • Implementation of general construction environmental best practice including, providing tool box talks for construction staff informing them of key ecological constraints within the area, and ensuring that open trenches are not left over night without safe means of egress for animals that may fall into them.
Location	Avoidance and mitigation measures will be located in relevant areas within the Scheme boundary.
Evidence for effectiveness	The standard pollution prevention measures to be implemented are proven to be effective in minimising the risk of pollution. Other proposed mitigation measures are also plainly established and uncontroversial and follow relevant best practice guidelines.
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	Detailed avoidance and mitigation measures will be implemented as part of appropriate Construction Method Statements and Construction Environmental Management Plans, in accordance with standard best practice and Design Manual for Roads and Bridges requirements. These documents will form the basis for contractual obligations of the main works contractor, and thus are considered robust mechanisms for delivery.
Characteristics of European Site(s) A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	North Downs Woodlands SAC (UK0030225)
Location and distance of the European Site from the proposed works	The North Downs Woodlands SAC is approximately 7 km south west of the scheme; and approximately 10 m from the closest point of the ARN.
European Site size	288.58 ha

North Downs Woodlands SAC Screening Matrix	
Key features of the European Site including the primary reasons for selection and any other qualifying interests	This site consists of mature beech forests and yew woods on steep slopes. The stands lie within a mosaic of scrub, other woodland types and areas of unimproved grassland on thin chalk soils. The beech and yew woodland is on thin chalk soils and where the ground flora is not shaded dog's mercury predominates. Associated with it is stinking iris and several very scarce species such as lady orchid and stinking hellebore. The chalk grassland, on warm south-facing slopes, is dominated by upright brome and sheep's-fescue but supports many other plants which are characteristic of unimproved downland, including the nationally rare ground pine. Annex I habitats that are a primary reason for site selection include: 9130 Asperulo-Fagetum beech forests (beech forests on neutral to rich soils) This site consists of mature Asperulo-Fagetum beech forests and also yew 91J0 Yew Taxus baccata woods on steep slopes. The stands lie within a mosaic of scrub and other woodland types and are the most easterly of the beech woodland sites selected. Parts of the woods were affected by the Great Storm of 1987. Approximately 53.1 ha of the European designated site comprises this habitat type. 91J0 Taxus baccata woods of the British Isles (yew dominated woodland)* Priority feature Yew Taxus baccata woodland at this site is associated with 9130 Asperulo-Fagetum beech forests, scrub and small areas of unimproved grassland on thin chalk soils. Where the shade is not too dense dog's mercury Mercurialis perennis predominates in the ground flora. The site is the most easterly of those selected. Approximately 66.08 ha of the European designated site comprises this habitat type. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site include: 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (dry grasslands and scrublands on chalk or limestone) (*important orchid sites) Approximately 40.4 ha of the European designated site comprises this habitat type.
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	Principal threats and pressures include: • Air pollution and air-borne pollutants. The Site Improvement Plan identifies that all qualifying features are affected by this threat; • Forest and plantation management and use. The Site Improvement Plan identifies that H9130 Beech forests on neutral to rich soils is the feature affected by this threat; • Outdoor sports and leisure activities, recreational activities. The Site Improvement Plan identifies that H9130 Beech forests on neutral to rich soils and H91J0 Yew-dominated woodland are the features affected by this threat; • Invasive non-native species. The Site Improvement Plan identifies H9130 Beech forests on neutral to rich soils is the feature affected by this threat.
European Site conservation objectives – where these are readily available	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of the qualifying natural habitats; • The structure and function (including typical species) of the qualifying natural habitats; and • The supporting processes on which the qualifying natural habitats rely.
Assessment Criteria Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.	

North Downs Woodlands SAC Screening Matrix	
The Scheme is located approximately 7 km from the North Downs Woodlands SAC. The only potential impact pathway that has been identified is the potential for increases in nitrogen oxides as a result of increased road traffic emissions and the resultant increase in nitrogen deposition on sensitive habitats within North Downs Woodlands SAC given its location within 200 m of the ARN. The assessment below discusses this potential impact pathway in more detail.	
Initial Assessment The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts. Describe any likely changes to the site arising as a result of:	
Reduction of habitat area	The Scheme would not result in a reduction in habitat area from within North Downs Woodlands SAC.
Disturbance to key species	The qualifying features of North Downs Woodlands SAC are not sensitive to disturbance.
Habitat or species fragmentation	The Scheme would not result in fragmentation of the North Downs Woodlands SAC.
Reduction in species density	The Scheme would not result in a reduction in species density within the North Downs Woodlands SAC.
Changes in key indicators of conservation value (water quality, etc)	It has been established that all of the qualifying features of the North Downs Woodlands SAC are sensitive to air pollution. Potential impacts on habitats as a result of nitrogen deposition could change key indicators of conservation value. Potential impacts include: • Changes in species composition, particularly in nutrient poor ecosystems with a shift towards species associated with higher nitrogen availability; • Reduction in species richness; • Increases in plant production; • Decrease or loss of sensitive lichens and bryophytes; and • Increases in nitrate leaching. **Setting screening thresholds** Critical loads and critical levels are a tool for assessing the risk of air pollution impacts to ecosystems. The critical load relates to the quantity of pollutant deposited from air to the ground, whereas the critical level is the gaseous concentration of a pollutant in the air. Critical loads and critical levels are used in impact assessments to assess the risk of impacts of projects on protected sites, and a principle function of the Air Pollution Information System (APIS) is to provide access to critical loads/levels and pollutant information. The APIS website (http://www.apis.ac.uk) provides critical loads for different pollutants and habitat types. Critical load values for nutrient nitrogen deposition are provided as a range, by habitat type, for use in detailed impact assessments in the UK. These are as follows for the qualifying features of North Downs Woodlands SAC. The APIS website advises that the minimum of the range should always be used for initial screening: Taxus baccata woods of the British Isles (H91J0) Critical Load 5 – 15 kg N/ha/yr Asperulo-Fagetum beech forests (H9130) Critical Load 10 – 20 kg N/ha/yr Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) (H6210) Critical Load 15 – 25 kg N/ha/yr Critical Levels for air pollutants are not habitat specific, as in critical loads, but have been set to cover broad vegetation types (e.g. forest arable, semi-natural), often with critical values set for sensitive lichens and bryophytes. They are 30 µg NO_x/m^3 annual mean.

North Downs Woodlands SAC Screening Matrix	
	The MAGIC website (https://magic.defra.gov.uk/) identified that habitats within North Downs Woodlands SAC within 200 m of the Affected Road Network comprise deciduous woodland and ancient woodland. This part of the SAC is also designated as Wouldham to Detling Escarpment Site of Special Scientific Interest (SSSI). The area of the SSSI within 200 m of the ARN is within unit 26 of the SSSI. The Natural England website was accessed for further details of unit 26. The main habitat present in this area is broadleaved, mixed and yew woodland and it was assessed as being in favourable condition. It was described as follows based on an assessment on 23.4.2008: minimal intervention woodland on the slope with a canopy of yew, mature beech and oak. There is a varied understorey typical of the woodland type. The ground flora includes a good range of characteristic plants including dogs mercury, stinking iris, bluebell, spurge laurel. Sycamore is present but does not appear to be causing adverse effects at present. There are adequate levels of natural tree regeneration Based on this information, it is considered that the qualifying features Taxus baccata woods of the British Isles (H91J0) and Asperulo-Fagetum beech forests (H9130) are likely to be present within 200 m of the ARN. Widely accepted Environmental Benchmarks for imperceptible impacts are set at 1% of the critical load or level[67]. This is considered by Natural England's air quality specialists to be suitably precautionary, as any emissions below this level are considered to be imperceptible. Table 21 of The Natural England document Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance provides a summary of relationships between long-term nitrogen deposition and species richness by habitat expressed as the amount of incremental nitrogen deposition (in kg N ha-1 yr-1) associated with a reduction in species richness of one species along the survey gradient sites[68]. By comparing the change in nitrogen deposition as a result of the Scheme with the type of habitat in Table 21, if the change in nitrogen deposition is lower than the values in Table 20 the Scheme impacts on the habitat are considered to be not significant. Applying screening thresholds Alone The air quality assessment has assessed a number of receptor locations within the North Downs Woodlands SAC within 200 m of the Affected Road Network. The change in nitrogen deposition as a result of the Scheme is calculated by comparing the deposition occurring with the Scheme, all of the committed development and the baseline (the Do Something scenario) with the deposition occurring with all of the committed development and the baseline, excluding the Scheme (the Do Minimum scenario). The maximum change in nitrogen deposition as a result of the Scheme occurs at the closest receptor location to the ARN (11 m), as expected. Taking the lowest critical load of 5 kg N/ha/yr the Scheme would result in a change in nitrogen deposition of 0.047 kg N/ha/yr. This is a change of 0.9% in relation to the lowest critical load level, so below the 1% threshold. The change in nitrogen deposition as a result of the scheme has been compared with the amount of nitrogen deposition required to reduce species richness by 1. The relationship is dependent on the background nitrogen deposition, which has been assumed to be 20 kg N. In the absence of the relevant habitat type, sand dunes have been used, which are considered to be the most sensitive. They require an increase in nitrogen deposition of 1.3 kg N/ha/yr to reduce species richness by 1. The maximum change in nitrogen deposition as a result of the Scheme occurs at the closest receptor location to the ARN (11 m), as expected.

[67] Natural England Internal Guidance - Approach to advising competent authorities on the assessment of road traffic emissions and HRAs V1.4 Final – June 2018
[68] Caporn, S., Field, C., Payne, R., Dise, N., Britton, A., Emmett, B., Jones, L., Phoenix, G., S Power, S., Sheppard, L. & Stevens, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210.

North Downs Woodlands SAC Screening Matrix	
	The Scheme would result in a maximum change in nitrogen deposition of 0.047 kg N/ha/yr, well below the threshold required to reduce species richness by 1. In-combination The air quality assessment includes consideration of committed development in order that an in-combination assessment in relation to air quality can be undertaken. This is done by comparing the maximum change in nitrogen deposition as a result of the Scheme and all of the committed development (the Do Something scenario) to the projected baseline nitrogen deposition in the year that the Scheme would open (2022) (the Do Nothing scenario). Taking the lowest critical load of 5 kg N/ha/yr the Scheme and other committed development would result in a change in nitrogen deposition of 0.03 kg N/ha/yr. This is a change of 0.6% in relation to the lowest critical load level, so below the 1% threshold. The change in nitrogen deposition as a result of the scheme and other committed development has also been compared with the amount of nitrogen deposition required to reduce species richness by 1. The relationship is dependent on the background nitrogen deposition, which has been assumed to be 20 kg N. In the absence of the relevant habitat type, sand dunes have been used, which are considered to be the most sensitive. They require an increase in nitrogen deposition of 1.3 kg N/ha/yr to reduce species richness by 1. The Scheme and other committed development would result in a maximum change in nitrogen deposition of 0.3 kg N/ha/yr, well below the threshold required to reduce species richness by 1. [Note, the change in nitrogen deposition would usually be expected to be larger for the assessment of the Scheme in combination with other plans and projects, than for the assessment of the Scheme alone, as the change in traffic flows would usually be larger. However, in this case, the change in nitrogen deposition is estimated to be larger with the Scheme alone. This is because traffic flows on the A249 northbound are lower in the Do Minimum scenario (i.e. committed development plus base, excluding the Scheme) than in the Do Nothing scenario (i.e. no Scheme or committed development, so baseline only) due to the M2 J5 becoming more congested and less desirable. In any case, the change, both for the alone and in combination assessment, is less than 1% of the lower range of the critical load.]
Climate change	Climate change is not listed as a threat or pressure in relation to this site.
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	No likely significant effects on the structure (i.e. the distribution and abundance of habitats) of North Downs Woodlands SAC are anticipated as a result of the Scheme alone or in combination with other plans or projects.
Interference with key relationships that define the function of the site	No likely significant effects on the function (i.e. the capacity of the SAC to support the qualifying features) of North Downs Woodlands SAC are anticipated as a result of the Scheme alone or in combination with other plans or projects.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	N/A
Disturbance to key species	N/A
Habitat or species fragmentation	N/A

North Downs Woodlands SAC Screening Matrix	
Loss	N/A
Fragmentation	N/A
Disruption	N/A
Disturbance	N/A
Change to key elements of the site (e.g. water quality, hydrological regime etc)	Based on the application of the screening thresholds, no likely significant effects as a result of air quality impacts are anticipated.
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	
N/A	
Outcome of screening stage	Not Likely to be Significant Effects
Are the appropriate statutory environmental bodies in agreement with this conclusion (Delete as appropriate and attach relevant correspondence).	YES. Response received to report (Version P02) from Nicky Britton-Williams at Natural England on 25 March 2019 via email (letter attachment, reference 276542), which stated: 'With regards to the North Downs Woodlands SAC (which includes Wouldham to Detling Escarpment SSSI) and Peters Pit SAC I concur with your conclusions of no likely significant effect on site integrity. As such I advise that these impacts can be screened out from further stages of assessment under the Habitats Regulations.' The full consultation response is included in Appendix E.

Appendix C. North Downs Woodlands SAC citation sheet

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0030225**

SITENAME **North Downs Woodlands**

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1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0030225

1.3 Site name

North Downs Woodlands

1.4 First Compilation date	1.5 Update date
2001-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	2001-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
0.403611111	51.34

2.2 Area [ha]:

288.58

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKJ4	Kent

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
6210			40.4		G	C	C	C	C
9130			53.1		G	B	C	B	B
91J0	X		66.08		G	A	B	B	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	63.0
N17	23.0
N09	14.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sedimentary,basic,nutrient-poor,limestone 2 Terrestrial: Geomorphology and landscape: escarpment,lowland,slope

4.2 Quality and importance

Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which the area is considered to support a significant presence. Asperulo-Fagetum beech forests for which this is considered to be one of the best areas in the United Kingdom. Taxus baccata woods of the British Isles for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	I01		B
H	H04		B
H	G01		I
H	B02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	A02		I
H	B02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐	Yes
☐	No, but in preparation
☒	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

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