ST MODWEN

ECOLOGYSOLUTIONS

Part of the ES Group

LAND OFF
WATLING STREET,
CANNOCK,
STAFFORDSHIRE

Information for Habitats Regulations Assessment

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ecology solutions for planners and developers

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PLANS

APPENDICES

1. INTRODUCTION

1.1. Background

1.1.1. Ecology Solutions was commissioned by St Modwen to undertake ecological assessment work in respect of Land off Watling Street, Cannock, Staffordshire (hereafter referred to as the Site).

1.1.2. Specifically, Ecology Solutions were instructed to assess the implications of potential development proposals for the Site on nearby designated Sites of European importance, namely Cannock Extension Canal Special Area of Conservation (SAC), which lies to the west of the Site boundary, and Cannock Chase SAC, which lies approximately 7.5km to the north-west. The relationship between the Site and these European designated Sites (also known as Habitats Sites) is illustrated on Plan ECO1.

1.1.3. Proposals at the Site are for the redevelopment of the existing business park (approximately 6.1ha) alongside a 9.86ha extension in order to provide mixed business development (B2/B8 split). The Site is being promoted for allocation within the emerging Cannock Chase Local Plan.

1.1.4. It is considered the information contained within this document provides Cannock Chase District Council (CCDC) with all the relevant information necessary to enable them to consider the allocation of the Site, in light of their requirements under the Habitats Regulations. The information presented within this report includes:

- A summary of relevant legislation, case law and guidance;
- The Conservation Objectives for the Cannock Extension Canal SAC and Cannock Chase SAC;
- The designating/qualifying criteria for the SACs;
- Potential effects on the SACs arising from emerging development proposals for the Site, with specific consideration of potential effects arising from employment development; and
- Strategies for avoidance, mitigation, and enhancement.

1.1.5. The findings of this assessment work are set out within this 'Information for Habitats Regulations Assessment' document (HRA), such that the competent authority (in this case the local planning authority [LPA]) has all the necessary information in order to carry out their duties in considering the scheme, in line with relevant planning policy and legislation, including specifically the Conservation of Habitats and Species Regulations 2017 (as Amended), hereafter referred to as the Habitats Regulations.

1.2. Site Characteristics

1.2.1. The Site is located to the west of Brownhills West, near Cannock. The northern boundary is formed by the A5, Watling Street, with agricultural land beyond. The land to the south, east and north-west of the Site boundary also comprises agricultural land. The south-western boundary of the Site lies adjacent to the Cannock Extension Canal.

1.2.2. The Site principally comprises a number of arable fields, together with an existing business park. Tree belts, scrub, ruderal vegetation, and ponds are also present within the Site boundary.

1.3. Purpose of this Report

1.3.1. This report specifically assesses the potential significant effects of the scheme on European designated sites within the local area (both alone and in combination with other plans/projects). Within this document specific regard is had to the test under Regulation 63 of the Habitats Regulations. Regulation 63 is described and considered further in Section 2 of this document.

1.3.2. The proximity of the Site to relevant European Sites is described in detail at Section 3 of this report, and is also shown on Plan ECO1.

1.3.3. As part of this assessment professional judgement has been applied in some instances in order to interpret information. Ecology Solutions is a member of the Chartered Institute of Ecology and Environmental Management (CIEEM), and its professional ecologists are qualified to make such judgements where appropriate.

1.3.4. It is noted that the competent authority, when looking at its own plan, will do so under the tests of Regulation 105 of the Habitat Regulations. At the time of bringing forward this plan, the authority will need to consider the combined impacts of its preferred allocations under the auspices of Regulation 105.

1.3.5. The purpose of this report is to provide the competent authority with the information required to consider the emerging scheme as a component of their wider emerging plan, for which they will be required to undertake assessment work in due course. Where appropriate consideration is given to suitably worded planning policies which would allow Habitats Sites to be safeguarded from harm at a strategic level.

2. LEGISLATIVE AND PLANNING POLICY BACKGROUND

2.1. This Section of the document outlines further details regarding the legislation and planning policy of particular relevance to the proposed scheme.

2.2. Legislation and relevant case law

2.2.1. The proximity of the Site to a European designated site means the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats Directive) and the EC Directive on Wild Birds (Birds Directive) are of relevance. The Directive is transposed in UK legislation through the Habitats Regulations 2017 (as Amended).

2.2.2. The relevant directive and UK legislation are discussed below.

Habitats and Birds Directives

2.2.3. Whilst the UK is no longer part of the European Union, the Habitats and Birds Directives remain relevant given they have underpinned and informed the legislation secured in the form of the Habitat Regulations 2017 (as Amended). These Directives are therefore summarised below.

2.2.4. Under the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, commonly referred to as the Habitats Directive (Council Directive 92/43/EEC), Member States are required to take special measures to maintain the distribution and abundance of certain priority habitats and species (listed in Annexes I and II of the Directive).

2.2.5. In particular, each Member State is required to designate the most suitable sites as SACs. All such SACs will form part of the Natura 2000 network under Article 3(1) of the Habitats Directive.

2.2.6. Article 2(3) sets out that Member States have a duty in exercising their obligations under the Habitats Directive to:

> *"… take account of economic, social and cultural requirements and local characteristics."*

2.2.7. Under the EC Directive on Wild Birds (the Birds Directive) (Council Directive 2009/147/EEC, previously 79/409/EEC), Member States are required to take special measures to conserve the habitats of certain rare species of birds, (listed in Annex I of the Directive), and regularly occurring migratory birds.

2.2.8. In particular, each Member State is required to classify the most suitable areas of such habitats as Special Protection Areas (SPAs). This is designed to protect wild birds, and to provide sufficient diversity of habitats for all species so as to maintain populations at an ecologically sound level. All Bird Directive SPAs will also be part of the Natura 2000 network under Article 3(1) of the Habitats Directive.

2.2.9. Thus, there is an obligation under the Habitats Directive and the Birds Directive for Member States to designate sites before turning to measures for their protection.

2.2.10. The protection afforded to SACs and SPAs is delivered through Article 6 of the Habitats Directive. Article 6(2) requires Member States to take appropriate steps to avoid the deterioration of natural habitats, and disturbance of species for which the sites have been designated, in so far as the disturbance could be significant in relation to the objectives of the Directive. Article 6(3) and Article 6(4) require a plan or project not directly connected with the management of the site, but likely to have a significant effect upon it, either individually or in combination with other plans or projects, must be subject to an Appropriate Assessment of its implications on the site, in view of the site's conservation objectives.

2.2.11. Having undertaken an Appropriate Assessment, the competent authority may agree to a plan or project where it can be concluded that it will not adversely affect the integrity of the site. In light of a negative assessment on the implications for the integrity of the site, Article 6(4) provides that the plan or project may still proceed where it can be demonstrated there are no alternatives, and there are imperative reasons of over-riding public interest as to why it must proceed. In the event a plan or project is to proceed on the basis of imperative reasons of over-riding public interest, by direction of Article 6(4), compensatory measures must be put in place to ensure the overall coherence of the Natura 2000 network is protected.

<u>The Conservation of Habitats and Species Regulations 2017 (as Amended)</u>

2.2.12. The Conservation of Species and Habitats Regulations 2017 (as Amended), commonly referred to as the Habitats Regulations, transpose the requirements of the Habitats Directive and the Birds Directive into UK legislation. The Habitats Regulations aim to protect a network of sites in the UK that have rare or important habitats and species, in order to safeguard biodiversity. The Habitats Regulations 2017 consolidate all the previous amendments made to the Habitats Regulations 2010.

2.2.13. Following Brexit the Habitats Regulations have been amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 ('the 2019 Amendment Regulations') to ensure the Habitats Regulations are 'fit for purpose' following Brexit. A number of the changes involve transferring functions from the European Commission to the appropriate authorities in England and Wales. The basic obligations of the competent authorities have not changed.

2.2.14. As a result of the 2019 Amendment Regulations, SACs and SPAs in the UK no longer form part of the European Union's Natura ecological network. The 2019 Amendment Regulations have created a National Site Network ('NSN') which includes existing SACs and SPAs, and any new SACs and SPAs designated under the Regulations.

2.2.15. The NSN is subject to network objectives which are set out at Regulation 16A of the Amendment Regulations.

2.2.16. Under the Habitats Regulations, competent authorities have a duty to ensure all the activities they regulate have no adverse effect on the integrity of any of the Natura 2000 sites (e.g. SPAs and SACs – now known as Habitats Sites). Regulation 63 of the Habitats Regulations requires:

> *"63(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for a plan or project, which:-*
>
> *(a) is likely to have a significant effect on a European Site or a European offshore marine Site (either alone or in combination with other plans or projects) and*
>
> *(b) is not directly connected with or necessary for the management of the Site,*
>
> *must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives.*
>
> *63(3) The competent authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority specifies.*
>
> *63(5) In the light of the conclusions of the assessment, and subject to regulation 64, the authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European Site or the European Offshore Marine Site (as the case may be).*
>
> *63(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which it proposes that the consent, permission or other authorisation should be given."*

2.2.17. In the case of 'land use plans', for example emerging local plans, the duty of the competent authority is instead imposed through Regulation 105 of the Habitats Regulations.

2.2.18. The implications of Regulation 105 are broadly identical to those imposed by Regulation 63 (albeit with the onus falling on the plan making authority). However, for the purposes of this document, the proposed allocation site has been considered primarily under the auspices of Regulation 63.

2.2.19. For clarity, Regulation 102 requires:

> *105.—(1) Where a land use plan—*

(a)is likely to have a significant effect on a European Site or a European offshore marine Site (either alone or in combination with other plans or projects), and

(b)is not directly connected with or necessary to the management of the site,

the plan-making authority for that plan must, before the plan is given effect, make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

(2) The plan-making authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority specifies.

(3) The plan-making authority must also, if it considers it appropriate, take the opinion of the general public, and if it does so, it must take such steps for that purpose as it considers appropriate.

(4) In the light of the conclusions of the assessment, and subject to regulation 107, the plan-making authority must give effect to the land use plan only after having ascertained that it will not adversely affect the integrity of the European Site or the European offshore marine Site (as the case may be).

(5) A plan-making authority must provide such information as the appropriate authority may reasonably require for the purposes of the discharge by the appropriate authority of its obligations under this Chapter.

(6) This regulation does not apply in relation to a site which is—

(a)a European Site by reason of regulation 8(1)(c), or

(b)a European Offshore Marine Site by reason of regulation 18(c) of the Offshore Marine Conservation Regulations (site protected in accordance with Article 5(4) of the Habitats Directive).

2.2.20. Regulations 63 and 105 of the Habitats Regulations therefore set out a two stage process. In each case the first test is to determine whether the plan/project is likely to have a significant effect on the European Site. The second test (if applicable) is to determine whether the plan/project will affect the integrity of the European Site.

2.2.21. Some key concepts of the Habitats Directive and Habitats Regulations have been clarified through case law. The most pertinent cases in relation to the development proposals are the *Waddenzee* Judgement, the *Sweetman* Case, the *Dilly Lane* Case, the Exminster *Judgment* and the *People over Wind* Judgement. These are discussed below.

<u>Waddenzee Judgement</u>

2.2.22. In the *Waddenzee* case the European Court of Justice decided an Appropriate Assessment is required for a plan or project where there is a probability or a risk that it will have a significant effect on the SPA. The Judgement states (at paragraph 3(a)) that:

> *"…any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects."*

2.2.23. Hence, the need for an Appropriate Assessment should be determined on a precautionary basis.

2.2.24. The Judgement gives clarity that the test of 'likely significant effect' should also be undertaken in view of the European Site's Conservation Objectives. It is stated at paragraph 3(b) that:

> *"where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site."*

2.2.25. Paragraph 4 of the Judgement emphasises the requirement for the Appropriate Assessment to rely on objective scientific information:

> *"…an appropriate assessment…implies that, prior to its approval, all the aspects of the plan or project which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives must be identified in the light of the best scientific knowledge in the field. The competent national authorities, taking account of the appropriate assessment of the implications…for the site concerned in the light of the site's conservation objectives, are to authorise such an activity only if they have made certain that it will not adversely affect the integrity of that site. That is the case where no reasonable scientific doubt remains as to the absence of such effects."*

<u>Sweetman Case</u>

2.2.26. Further guidance in relation to the consideration of impacts in the light of the Habitats Regulations is provided in the '*Sweetman'* case (*Sweetman* v *An Bord Pleanala* (C-258/11) [2014]). The case as set out by the Advocate General considered in detail the test for likely significant effect in paragraphs 50 and 51:

> *"50. The test which that expert assessment must determine is whether the plan or project in question has 'an adverse effect on the integrity of the site', since that is the basis on which the competent national authorities must reach their decision. The threshold at this (the second) stage is noticeably higher than that laid down at the first stage. That is because the question (to use more simple terminology) is not 'should we bother to check' (the question at the*

first stage) but rather 'what will happen to the site if this plan or project goes ahead; and is that consistent with "maintaining or restoring the favourable conservation status" of the habitat or species concerned'…

51. It is plan, however, that the threshold laid down at this stage of Article 6(3) may not be set too high, since the assessment must be undertaken having rigorous regard to the precautionary principle. That principle applies where there is uncertainty as to the existence or extent of risks. The competent national authorities may grant authorisation to a plan or project only if they are convinced that it will not adversely affect the integrity of the site concerned. If doubt remains as to the absence of adverse effects, they must refuse authorisation."

2.2.27. The Court of Justice of the European Union (CJEU) agreed with the Advocate General's conclusions, and held:

"40. Authorisation for a plan or project, as referred to in Article 6(3) of the Habitats Directive, may therefore be given only on condition that the competent authorities – once all aspects of the plan or project have been identified which can, by themselves or in combination with other plans or projects, affect the conservation objectives of the site concerned, and in the light of the best scientific knowledge in the field – are certain that the plan or project will not have lasting adverse effects on the integrity of that site. That is so where no reasonable scientific doubt remains as to the absence of such effects."

2.2.28. Hence a plan or project may be authorised only if no reasonable scientific doubt remains as to the absence of effects. Reasonable scientific doubt will exist if the evidence is not sufficiently conclusive, or if there are gaps in the information.

<u>Dilly Lane Case</u>

2.2.29. The Secretary of State's decision to allow an appeal in relation to applications for a total of 170 new homes on a greenfield site off Dilly Lane, Hartley Wintney was challenged in High Court by Hart District Council. The legal challenge was made on the grounds the Secretary of State had erred in departing from her Inspector's conclusions as to the effects on the Thames Basin Heaths SPA.

2.2.30. A key issue for the case was whether mitigation measures should be disregarded when assessing whether the project would have a significant effect on the SPA. Mr Justice Sullivan (now Lord Justice Sullivan) ruled in favour of the Secretary of State after concluding there was no absolute legal rule that mitigation measures should be disregarded during the first stage – 'the likely significant test':

"55. The competent authority is not considering the likely effect of some hypothetical project in the abstract. The exercise is a practical one which requires the competent authority to consider the likely effect of the particular project for which permission is being sought.

If certain features (to use a neutral term) have been incorporated into that project, there is no sensible reason why those features should be ignored at the initial, screening, stage merely because they have been incorporated into the project in order to avoid, or mitigate, any likely effect on the SPA."

2.2.31. The position adopted in 'People over Wind' (see below) revokes the position summarised above, albeit other issues considered within the Judgment remain sound.

Exminster Judgment

2.2.32. Also of note is the Judgement handed down by Lord Justice Sales on 5 March 2015 in Dianne Smyth v The Secretary of State for Communities and Local Government [2015] EWCA Civ 174. That case concerned an Appeal by Mrs Smyth against the decision of Mrs Justice Patterson sitting in the High Court [2013] EWHC 3844 who dismissed an application made by Mrs Smyth to quash the appeal decision to grant planning permission to Bellway for the development of 65 residential dwellings on land at Sentry's Farm, Exminster, Devon. In that case the development site was located close to the Exe Estuary SPA ("the SPA"), which is also notified as a SSSI. The SPA incorporates the Dawlish Warren SAC ("the SAC").

2.2.33. Amongst other matters, this case considered the weight that should be attributed to an experts professional judgment.

2.2.34. Lord Justice Sales makes clear that an experts experience can be classed as objective information, as set out in paragraphs 46 and 47 of the Judgment. These paragraphs state:

46. Mr Jones submitted that Mr Goodwin's evidence amounted merely to assertion, unsupported by any objective evidence. I do not agree. Three points should be made. First, I consider that on a fair reading of Mr Goodwin's proof of evidence it can be seen that he has drawn on specific information relevant to the SPA and the SAC, as well as the development site and proposed mitigation measures, in a manner which supports in an entirely conventional and acceptable way his expressions of opinion as an ecological expert. By way of example, at paras. 10.4 and 10.5 of his proof, he pointed out that, contrary to the suggestion made by GIE's representative at the inquiry, it was not appropriate to use the analogy of mitigation measures developed for heathland sites (a 400m exclusion zone), where ground nesting birds might be subject to predation by cats, since for the SPA "the designating bird features are wintering or passage species and access to large parts of the Site is not possible in any event" (because it is marshland or cut off by water). He referred to the Interim Report and the Disturbance Study, as appropriate. Mr Goodwin demonstrated a good understanding of the particular ecological and mitigation features relevant to the SPA and the SAC. Contrary to Mr Jones's contention, Mr Goodwin's evidence was very far from being unsupported, free-standing assertion.

> *47. Secondly, in my view it is acceptable and to be expected that an expert will draw on his own background knowledge, experience and expertise in the field to inform the opinions which constitute his evidence to a relevant decision-maker (here, the Inspector). That is, indeed, in large part the point of looking to expert witnesses to provide assistance on technical matters. In this case, Mr Goodwin's own practical experience, the practical experience of ecologists generally and the knowledge shared between them all informed the expertise which he was able to bring to bear in giving his views regarding the effects of the development and the practical impact and viability of the mitigation options which he reviewed in his proof of evidence.*

2.2.35. Paragraph 84 of the Judgment further clarifies that expert evidence can be considered as objective, stating:

> *…Mr Goodwin's evidence set out careful reasoning by him, with reference back as appropriate to underlying facts, to explain his opinion and expressions of view. It was expert evidence in conventional form and of good quality. Mr Goodwin was entitled to draw on his own experience and expertise as well, in forming his opinion: see paras. [46]-[48] above.*

2.2.36. The Exminster case further considered the appropriate procedures for assessing in-combination impacts which may arise through combined development within the Zone of Influence of a European Site.

<u>*Wealden v SSCLG* [2017] ('the *Wealden* Judgment 2017')</u>

2.2.37. The *Wealden* judgment is of specific relevance to the emerging proposals at the Site. It considers the appropriate approach to adopt when undertaking an in-combination assessment where several plans or projects, with no significant impacts alone, could together reach a threshold deemed to be significant. This Judgment specifically considers matters of air quality, as is relevant for the Site at Watling Street.

2.2.38. The Judgment was handed down by Mr Justice Jay in the case between Wealden District Council and the Secretary of State for Communities and Local Government, Lewis District Council and the South Downs National Park Authority [Wealden v SSCLG (2017) EWHC 351 (Admin] was concerned with matters relating to air quality impacts on European Sites (in that case the Ashdown Forest SPA/SAC).

2.2.39. A critical issue explored within the Judgment was whether it is correct to test a plan or project against threshold values (in that case relating to the deposition of nitrogen from increased road traffic) in isolation, with no recourse to undertake a true in combination test.

2.2.40. This matter was specifically considered by Mr Justice Jay at paragraph 108 of his Judgment. Here he concludes the only rational approach would be for plans or projects which would cumulatively exceed a threshold value (such as nitrogen deposition) to be considered in-combination. The premise of this paragraph is Mr Justice Jay's view that it would be illogical not to consider the residual impacts of a plan or project alongside residual impacts of other relevant schemes (i.e. in combination).

2.2.41. The Wealden Judgment therefore confirms that the use of the project / plan level 1000 AADT threshold (equivalent to 1% of the critical level/load for receiving habitat) as the only means of addressing in-combination effects was not appropriate, particularly where other AADT values are known and importantly which, when added together, breach the threshold. The 1000 AADT (and 1%) thresholds themselves were not questioned in terms of their use for assessment purposes.

2.2.42. The Judgment clarified that whilst the 1000 AADT (and 1% of the critical load / level) threshold is appropriate for use in screening assessments when applying the tests of the Habitats Regulations, a true in combination assessment must be undertaken, in view of all relevant AADT data.

2.2.43. As a result of the Wealden Judgement, updated guidance has been produced by Natural England (as referenced below) in relation to the assessment of road traffic emissions on European designated sites.

<u>People over Wind Case</u>

2.2.44. The CJEU in *People over Wind v Coillte Teoranta* (C-323/17) [2018], commonly referred to as '*People over Wind*' or Sweetman II, has reversed the position adopted under the *Dilly Lane* Decision that it was right and proper for mitigation or avoidance measures, which formed a feature of a plan / project, to be viewed as integral to the plan / project and not excluded when considering the likely significance test at Regulation 63(1).

2.2.45. The decision by the CJEU ruled that:

> *"Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site."*

2.2.46. In accordance with this ruling, avoidance or mitigation measures cannot be considered at the first stage of the test (the 'Likely Significant Effect' stage) and can only be considered at the Appropriate Assessment stage.

2.2.47. This ruling conflicts with and overrules a long line of domestic case law (notably the *Dilly Lane Decision (oao) Herts District Council v. Secretary of State for Communities and Local Government and Others* [2008] EWHC 1204 (Admin)), as summarised above, which previously held that it is appropriate to consider such measures at the 'Likely Significant Effect' stage.

2.2.48. In considering the above, it is logical to distinguish between measures which are specifically "*intended to avoid or reduce the harmful effects"* (i.e. mitigation measures for the purposes of a HRA) and measures which would come forward in any event (i.e. intrinsic elements of scheme design). Notwithstanding that these latter measures may, by default, avoid or reduce harmful effects on a European Site(s), if they are integral elements of a development proposal, it remains appropriate to consider them at the first stage of the test.

ESB Wind Developments (Sweetman III) [Case C-164/17]

2.2.49. In this case a request for a preliminary ruling was made to the CJEU concerning the interpretation of Articles 6(3) and 6(4) of Council Directive 92/43/EEC (the Habitats Directive). The request was made in relation to proceedings brought by Mr Peter Sweetman and Edel Grace against the decision of An Bord Pleanála (National Planning Appeals Board, Ireland) concerning the latter's decision to grant ESB Wind Developments Limited and Coillte permission for a wind farm project within an SPA. The ruling was handed down on 25 July 2018.

2.2.50. This ruling distinguishes between, for the purpose of the application of Articles 6(3) and 6(4) of the Directive, 'mitigation' that consists of measures intended to avoid or reduce harm to the protected site, and measures intended to compensate for any harm (compensatory measures). It is stated:

> *"Article 6 of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, where it is intended to carry out a project on a site designated for the protection and conservation of certain species, of which the area suitable for providing for the needs of a protected species fluctuates over time, and the temporary or permanent effect of that project will be that some parts of the site will no longer be able to provide a suitable habitat for the species in question, the fact that the project includes measures to ensure that, after an appropriate assessment of the implications of the project has been carried out and throughout the lifetime of the project, the part of the site that is in fact likely to provide a suitable habitat will not be reduced and indeed may be enhanced may not be taken into account for the purpose of the assessment that must be carried out in accordance with Article 6(3) of the directive to ensure that the project in question will not adversely affect the integrity of the site concerned; that fact falls to be considered, if need be, under Article 6(4) of the directive."*

2.2.51. The ruling clarifies (in the context of the specifics of that project) what constitutes mitigation and what should correctly be termed

compensation. It confirms that mitigation should be subject to Appropriate Assessment under Article 6(3) but, measures designed to compensate for any harm rather than prevent it, cannot be considered under Article 6(3) (Appropriate Assessment). In such instances, the proposal must be considered under Article 6(4) and thus it cannot be permitted unless there are, "Imperative Reasons of Overriding Public Interest".

Holohan Judgment

2.2.52. In the case of *Holohan v. An Bord Pleanála* the CJEU considered the Appropriate Assessment procedure to be adopted when considering potential impacts on a European Site. In considering this case, the CJEU ruled, amongst other matters:

a) *An Appropriate Assessment (AA) must catalogue the entirety of the habitat types and species for which a site is protected.*

b) *It must also identify and examine the implications of the proposed project for the species present on that site and for which that site has not been listed. Additionally, it must examine the implications for habitat types and species outside the boundaries of the protected site, insofar as those implications are liable to affect the site's Conservation Objectives.*

c) *Where the competent authority rejects findings of an expert that additional information must be obtained, the Appropriate Assessment must include a detailed statement dispelling all reasonable scientific doubt concerning effects on the protected site.*

2.2.53. This assessment document is fully compliant with the relevant parts of the *Holohan* Judgment. The qualifying interest features are referred to wherever appropriate (described in detail at paragraphs 4.1 to 4.5 of this assessment report). The relevant information, as submitted to Europe relating to such matters, is included at Appendix 2 and referenced where appropriate. Consideration has been given to implications for habitats and species located outside of the SAC, with reference to the Site's conservation objectives, and the possibility an adverse effect on the integrity of the Site could arise.

The Dutch Nitrogen Cases

2.2.54. On 7th November 2018 the Judgment of the CJEU was handed down pursuant to a reference for a Preliminary Ruling relating to the application of Article 6 of the Habitats Directive in joined cases C-293/17 and C-294/17. The cases concerned authorisation schemes for agricultural activities which cause nitrogen deposition on Natura 2000 (European) sites in the Netherlands.

2.2.55. Key parts of the ruling (insofar as they are relevant to this assessment) are discussed below.

2.2.56. In line with preceding case law (Waddenzee and Sweetman, discussed above) the need for scientific rigour and firm conclusions as to the absence of effects are a pre-requisite for authorisation of a plan/project. Ruling 3 in the case states:

> *"Article 6(3) of Directive 92/43 must be interpreted as not precluding national programmatic legislation which allows the competent authorities to authorise projects on the basis of an 'appropriate assessment' within the meaning of that provision, carried out in advance and in which a specific overall amount of nitrogen deposition has been deemed compatible with that legislation's objectives of protection. That is so, however, only in so far as a thorough and in-depth examination of the scientific soundness of that assessment makes it possible to ensure that there is no reasonable scientific doubt as to the absence of adverse effects of each plan or project on the integrity of the site concerned, which it is for the national court to ascertain."*
>
> [emphasis added]

2.2.57. Ruling 4 in the case states:

> *"Article 6(3) of Directive 92/43 must be interpreted as not precluding national programmatic legislation, such as that at issue in the main proceedings, exempting certain projects which do not exceed a certain threshold value or a certain limit value in terms of nitrogen deposition from the requirement for individual approval, if the national court is satisfied that the 'appropriate assessment' within the meaning of that provision, carried out in advance, meets the criterion that there is no reasonable scientific doubt as to the lack of adverse effects of those plans or projects on the integrity of the Sites concerned."*
>
> [emphasis added]

2.2.58. Ruling 5 in the case states:

> *"Article 6(3) of Directive 92/43 must be interpreted as precluding national programmatic legislation, such as that at issue in the main proceedings, which allows a certain category of projects, in the present case the application of fertilisers on the surface of land or below its surface and the grazing of cattle, to be implemented without being subject to a permit requirement and, accordingly, to an individualised appropriate assessment of its implications for the sites concerned, unless the objective circumstances make it possible to rule out with certainty any possibility that those projects, individually or in combination with other projects, may significantly affect those Sites, which it is for the referring court to ascertain."*

[emphasis added]

2.2.59. Ruling 6 in the case confirms that any measures which are relied upon to mitigate or avoid adverse effects on the integrity of the European Site in question, must be certain at the time of assessment. It is stated:

> *"Article 6(3) of Directive 92/43 must be interpreted as meaning that an 'appropriate assessment' within the meaning of that provision may not take into account the existence of 'conservation measures' within the meaning of paragraph 1 of that article, 'preventive measures' within the meaning of paragraph 2 of that article, measures specifically adopted for a programme such as that at issue in the main proceedings or 'autonomous' measures, in so far as those measures are not part of that programme, if the expected benefits of those measures are not certain at the time of that assessment."*

[emphasis added]

2.3. Guidance and Other Relevant Documents

2.3.1. Guidance on the interpretation of key terms and concepts contained within the European and UK legislation of relevance to European designated sites is provided through several documents issued by the European Commission and national organisations such as the Joint Nature Conservation Committee (JNCC) and Natural England (NE). This guidance is discussed below.

Managing Natura 2000 Sites (European Communities, 2000)

2.3.2. The document entitled '*Managing Natura 2000 Sites the Provisions of Article 6 of the Habitats Directive 92/43/CEE'*, published by the European Commission in 2000, provides guidelines to Member States on the interpretation of certain key concepts used in Article 6 of the Habitats Directive.

2.3.3. It should be noted that the section relating to Article 6(4) has subsequently been replaced through the publication of a further guidance document by the European Commission in 2007 entitled '*Guidance document on Article 6(4) of the Habitats Directive'*, which is considered below under the relevant heading.

2.3.4. This document states at section 2.3.3 that conservation measures must correspond to the ecological requirements of the habitats and species present for which the site is designated, and that these requirements *"involve all the ecological needs necessary to ensure their favourable conservation status".*

2.3.5. At section 3.5 the guidance states, in relation to deterioration and disturbance of habitats or species:

> *"Deterioration or disturbance is assessed against the conservation status of species and habitats concerned. At a site level, the maintenance of the favourable conservation status has to be*

evaluated against the initial conditions provided in the Natura 2000 standard data forms when the site was proposed for selection or designation, according to the contribution of the site to the ecological coherence of the network. This notion should be interpreted in a dynamic way according to the evolution of the conservation status of the habitat or the species."

2.3.6. Section 4.4.1 sets out that in determining what may constitute a likely 'significant' effect one should take into account the conservation objectives for the designated site and other relevant baseline information. In the second paragraph of this section of the document it is stated:

"In this regard, the conservation objectives of a site as well as prior or baseline information about it can be very important in more precisely identifying conservation sensitivities."

2.3.7. Section 4.5.3 of the document sets out the duty of Member States to provide certain specific information in support of the inclusion of a site within the Natura 2000 network. This information is to be provided in a format specified by the European Commission (the Natura 2000 Standard Data Form).

2.3.8. A link is drawn between the Standard Data Form and the formation of the site's conservation objectives within the text box at the end of section 4.5.3 of the guidance where it is stated:

"The information provided according to the standard data form established by the Commission forms the basis for a Member State's establishment of the Site's conservation objectives."

2.3.9. With regard to an assessment of the effects of a plan/project on the integrity of a designated site, the 'integrity of the site' is defined at section 4.6.3 as:

"… the coherence of the site's ecological structure and function, across the whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified."

2.3.10. The guidance is clear, within the text box at the foot of page 39, that an assessment as to the implications of the plan/project on the integrity of the designated site should be limited to an assessment against the site's conservation objectives:

"The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives."

2.3.11. Section 5 of Managing Natura 2000 Sites deals with Article 6(4) of the Habitats Directive. Note that this section has been expanded upon and replaced by further guidance issued by the European Commission entitled "*Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC*" (2007). This document is dealt with below.

Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites - Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2001)

2.3.12. This document, published by the European Commission in 2001, gives guidance on carrying out and reviewing those assessments required under Article 6(3) and (4) of the Habitats Directive. It is provided as supplementary guidance and does not over-ride or replace any of that set out within '*Managing Natura 2000*' (European Commission, 2000) which as stated at page 6 of the document, "is the starting point for the interpretation of the key terms and phrases contained in the Habitats Directive". The guidance provided is not mandatory, and it is clearly set out that its use is "*optional and flexible*" and it is for "*Member States to determine the procedural requirements deriving from the directive*".

2.3.13. The guidance sets out the key stages in following the tests contained within the Habitats Directive. Pertinent to an assessment under Regulation 63 (and indeed Regulation 105), stages one and two are relevant. Stage one is the screening stage, assessing the likelihood of a plan/project resulting in a significant effect upon the European Site. The second comprises the Appropriate Assessment.

2.3.14. Section 3.2.4 is concerned with Appropriate Assessment and specifically, the assessment against the conservation objectives of the European Site. Box 9 provides a list of five example conservation objectives for differing broad habitat types. One such example, that for a coastal site, taken from Box 9 is provided below:

> *"to maintain the status of the European features of this coastal site in favourable condition, allowing for natural change. Features include coastal shingle vegetation and lagoons (within a candidate special area of conservation (SAC), which is also an SPA)."*

Internal Guidance to Decisions on 'Site Integrity': A Framework for Provision of Advice to Competent Authorities (English Nature, 2004)

2.3.15. NE (English Nature [EN] at the time) has produced an internal guidance document on the provision of advice to competent authorities regarding the concept of 'site integrity' in undertaking an Appropriate Assessment.

2.3.16. This guidance sets out a definition for integrity. It states that integrity is considered at the site level and gives the following definition (taken from PPG9):

> *"The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or levels of populations of the species for which it was classified".*

2.3.17. Integrity is further defined within section 3.0 where it is stated:

"In a dynamic context 'integrity' can be considered as a site having a sense of resilience and ability to evolve in ways that are favourable to conservation."

2.3.18. The need to maintain or restore the designated site to favourable conservation status is dealt with in the final paragraph of section 3.0. NE quotes guidance issued jointly by the Environment Agency (EA), EN and Countryside Council for Wales (CCW).

2.3.19. The guidance provides a checklist within section 4.1, for assessing the likelihood of an adverse effect on integrity occurring as a result of the proposed plan/project. It is stated that if the answer to all the questions posed within the checklist is "yes" then it is reasonable to conclude there will be no adverse effect upon integrity. In the event one or more of the answers is "no", then the guidance suggests a series of further site specific factors, listed at 4.2 to 4.7.

Common Standards Monitoring (JNCC, 2004)

2.3.20. Common Standards Monitoring (CSM) is a means by which condition objectives for habitats, species, or other features of designated sites (e.g. SSSIs and SPAs) are set based on key attributes of the features.

2.3.21. JNCC and the Country Conservation Agencies (e.g. NE) developed guidance on the setting and assessing of condition objectives, as required under the Birds and Habitats Directives, and set out a framework for this in 1999. This framework is provided in the form of CSM guidance which comprises a suite of documents including an '*Introduction to the Guidance Manual on Common Standards Monitoring*' and several species/habitat specific documents. The guidance manual covers various relevant concepts and terms. It also provides a background to the setting of conservation objectives, and sets out the desired approach to setting targets, monitoring, management, and reporting on conservation measures in designated sites.

2.3.22. The guidance manual and CSM guidance for individual site attributes (e.g. its bird or reptile interest) sets out specific criteria regarding the identification of interest features, targets, and methods of assessment. There is inbuilt flexibility and allowances for 'judgements to be made' when assessing, for example, favourable condition.

2.3.23. It is understood NE applies the CSM approach to European designated sites through an assessment of the SSSI unit condition. This is undertaken on a cycle of approximately six years. The assessment does not relate to the conservation objectives of the European Site but provides a tool for tailoring future management of the SSSI, such that favourable condition of the interest features can be maintained or restored as appropriate.

Guidance Document on Article 6(4) of the 'Habitats Directive' (European Commission, 2007)

2.3.24. This document, published by the European Commission in 2007, is intended to provide clarification on key terms/concepts as referred to within '*Managing Natura 2000 Sites*' and replaces the section on Article 6(4) within that earlier document.

2.3.25. The document covers in particular, the concepts of 'Alternative Solutions', 'Imperative Reasons of Overriding Public Interest', 'Compensation Measures', 'Overall Coherence' and the 'Opinion of the Commission'.

2.3.26. With regard to ensuring the quality of an Appropriate Assessment, and to define exactly what needs to be compensated, it is stated at section 1.3:

> *"Assessment procedures of plans or projects likely to affect Natura 2000 Sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity."*

2.3.27. The need to use information contained within the Natura 2000 Standard Data Form, in tandem with the site's conservation objectives when undertaking an Appropriate Assessment is specifically referred to (under the second hyphenated point at section 1.3 on page 5).

2.3.28. Section 1.3.2 gives guidance on the application of Article 6(4) in respect of reasons of overriding public importance and section 1.4.1 gives guidance on the application of Article 6(4) in respect of compensatory measures.

Natura 2000 Standard Data Forms

2.3.29. A standard reporting format has been developed for Natura 2000 Sites (SPAs and SACs) to ensure the relevant site selection information is reported and stored in a consistent manner which can easily be made available.

2.3.30. A standard reporting form for SPAs and SACs was developed by the European Commission and published in 1996. The form is used for all sites designated or proposed to be designated as SPAs and SACs under the relevant Directives, with the information to be stored on a central database.

2.3.31. Article 4 of the Habitats Directive provides the legal basis for providing the data. Article 4 states that information shall include a map of the designated site, its name, location, extent, and the data resulting from application of the criteria specified in Annex III, and that this shall be provided in a format established by the Commission. Under Article 4 (paragraph 3) of the Birds Directive Member States are required to

provide the Commission with all relevant information to enable it to take any appropriate steps in order to protect relevant species in areas where the Directive applies.

2.3.32. Whilst it is the relevant country agency (i.e. NE) that is responsible for designating a site, it is the JNCC who are responsible for collating the lists of European and international designated sites, together with relevant supporting information. The Natura 2000 Data Forms for SPAs and SACs are therefore made available by JNCC.

2.3.33. Within the explanatory notes for Natura Standard Data Forms the following "main objectives" of the Natura data form/database are given:

1. *"to provide the necessary information to enable the Commission, in partnership with the Member States, to co-ordinate measures to create a coherent Natura 2000 network and to evaluate its effectiveness for the conservation of Annex I habitats and for the habitats of species listed in Annex II of Council Directive 92/43/EEC as well as the habitats of Annex I bird species and other migratory bird species covered by Council Directive 79/409/EEC."*

2. *"to provide information which will assist the Commission in other decision making capacities to ensure that the Natura 2000 network is fully considered in other policy areas and sectors of the Commission's activities in particular regional, agricultural, energy, transport and tourism policies."*

3. *"to assist the Commission and the relevant committees in choosing actions for funding under LIFE and other financial instruments where data relevant to the conservation of sites, such as ownership and management practice, are likely to facilitate the decision making process."*

4. *"to provide a useful forum for the exchange and sharing of information on habitats and species of Community interest to the benefit of all Member States."*

Conservation Objectives

2.3.34. The formal European Site Conservation Objectives for SPAs and SACs are produced by NE. For clarity, a copy of the European Site Conservation Objectives for the relevant SACs is attached to this iHRA report and is summarised below (see Section 4).

2.4. **Planning Policy**

National Planning Policy Framework

2.4.1. Guidance on national policy for biodiversity and geological conservation is provided by the National Planning Policy Framework (NPPF), published in March 2012, revised on 24 July 2018, 19 February 2019, and again on 20 July 2021. It is noted, the NPPF continues to refer to further guidance in respect of statutory obligations

for biodiversity and geological conservation and their impact within the planning system provided by Circular 06/05 (DEFRA/ODPM, 2005) accompanying the now defunct Planning Policy Statement 9 (PPS9).

2.4.2. The key element of the NPPF is there should be "a presumption in favour of sustainable development" (paragraphs 10 to 11). It is important to note this presumption "does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site" (paragraph 182). 'Habitats site' has the same meaning as the term 'European site' as used in the Habitats Regulations 2017.

2.4.3. Hence, the direction of Government policy is clear. That is, the presumption in favour of sustainable development is to apply in circumstances where there is potential for an effect on a European site, if it has been shown there will be no adverse effect on that designated site as a result of the development in prospect.

2.4.4. A number of policies in the NPPF are comparable to those in PPS9, including reference to minimisation of impacts to biodiversity and provision of net gains to biodiversity (paragraph 174).

2.4.5. The NPPF also considers the strategic approach local authorities should adopt with regard to the protection, maintenance, and enhancement of green infrastructure, priority habitats and ecological networks, and the recovery of priority species.

2.4.6. Paragraphs 179 to 181 of the NPPF comprise a number of principles local authorities should apply, including encouraging opportunities to incorporate biodiversity in and around developments; provision for refusal of planning applications if significant harm cannot be avoided, mitigated or compensated for; applying the protection given to European sites to potential SPAs, possible SACs, listed or proposed Ramsar sites, and sites identified (or required) as compensatory measures for adverse effects on European sites; and the provision for the refusal for developments resulting in the loss or deterioration of 'irreplaceable' habitats – unless there are 'wholly exceptional reasons' (for instance, infrastructure projects where the public benefit would clearly outweigh the loss or deterioration of habitat) and a suitable compensation strategy exists.

2.4.7. National policy therefore implicitly recognises the importance of biodiversity and that, with sensitive planning and design, development and conservation of the natural heritage can co-exist and benefits can, in certain circumstances, be obtained.

ODPM/DEFRA Circular (ODPM/DEFRA, 2005)

2.4.8. Guidance on the determination of whether an effect on a European designated site is likely to be significant, together with the scope of Appropriate Assessments and ascertaining the effect on the integrity are provided within the DEFRA Circular (ODPM & DEFRA, 2005). This

DEFRA Circular was published in relation to Planning Policy Statement 9 (PPS9), which was superseded by the NPPF (2012, 2018 and 2019). However, the NPPF retained reference to the DEFRA Circular (2005).

2.4.9. With respect to the significance test, the DEFRA Circular states at paragraph 13:

"The decision as to whether an appropriate assessment is necessary should be made on a precautionary basis".

2.4.10. The *Waddenzee* Judgment is specifically referred to at paragraph 13 of the Circular. With regards to the need to undertake an Appropriate Assessment; this is only required where it is not possible to conclude, on the basis of objective information, that the plan/project will not have a significant effect on the European Site, either individually or in combination with other plans/projects.

2.4.11. Paragraph 14 of the Circular clarifies that in considering the likely significance of an effect, the decision taker should assess whether the effect would be significant in terms of the site's conservation objectives.

2.4.12. Paragraph 15 of the Circular clarifies the importance of assessing the likely significant effect on each of the interest features for which the site is designated.

2.4.13. Guidance on the scope of an Appropriate Assessment is provided at paragraph 17 of the Circular:

"If the decision-taker concludes that a proposed development (not directly connected with or necessary to the management of a site) is likely to significantly affect a European Site, they must make an appropriate assessment of the implications of the proposal for the site in view of the site's conservation objectives. These relate to each of the interest features for which the site was classified…The scope and content of an appropriate assessment will depend on the nature, location, duration and scale of the proposed project and the interest features of the relevant site. It is important that an appropriate assessment is made in respect of each interest feature for which the site is classified; and for each designation where a site is classified under more than one international obligation…"

2.4.14. At paragraph 20 of the Circular, the definition of "integrity" for the purpose of interpreting the tests contained within the Habitats Regulations is given as:

"The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified."

2.4.15. The Circular includes a flow diagram (see Appendix 1) setting out the series of steps competent authorities are required to take in considering proposals affecting internationally designated NCSs. This

is based on the information and flow charts given in guidance issued by the European Commission (European Commission Environment DG, 2001).

2.4.16. The information contained within this report follows the steps outlined in the flow diagram, and takes account of the EC guidance on the basis of information currently available on the nature of the development in relation to those Internationally Designated Nature Conservation Sites identified within this assessment. Professional judgement has been applied to interpret this information within the context of the sites conservation objectives and the criteria under which they are designated.

National Designated Sites (SSSIs)

Wildlife and Countryside Act 1981 (as Amended)

2.4.17. The Wildlife and Countryside Act 1981 consolidated and amended existing national legislation in order to implement the Birds Directive and the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The Act received royal assent on 30 October 1981 and is supplemented by the Wildlife and Countryside (Service of Notices) Act 1985, with various other amendments also having occurred through Acts such as the Countryside and Rights of Way (CROW) Act 2000, Wildlife and Countryside Act 1981 (England and Wales) (Amendment) Regulations 2004 and the Nature Environment and Rural Communities Act 2006.

2.4.18. The Wildlife and Countryside Act 1981 (as Amended) provides for the notification and confirmation of SSSIs, which are sites that have been identified for their important flora, fauna, geological, or physiographical features, and also provides a level of protection to certain species of flora and fauna, with special penalties available for offences in connection with impacts on more vulnerable species, as identified within the accompanying Schedules to the Act.

2.4.19. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were afforded by the Countryside and Rights of Way Act 2000 (England and Wales only).

2.4.20. It should be noted that the SSSI designation underpins the further designation of sites as SPAs, SACs and Ramsar Sites.

3. CONSERVATION STATUS OF CANNOCK EXTENSION CANAL SAC & CANNOCK CHASE SAC

3.1. This Section of the report sets out the reasons for the designation of Cannock Extension Canal SAC and Cannock Chase SAC. A plan showing the relationship between the Site and these SACs is included at Plan ECO1 and discussed below.

Cannock Extension Canal SAC

3.2. Cannock Extension Canal SAC is situated adjacent to the south-west of the Site at its closest point, albeit the closest proposed built development at the Site would be located approximately 120m from the SSSI and SAC at its closest point. This SAC comprises a cul-de-sac canal, which is linked to the Wyrley and Essington Canal to the south.

SAC Qualifying Features

3.3. Cannock Extension Canal SAC is classified as being of European level importance on account of it supporting a large population of the Annex II species Floating Water-plantain *Luronium natans*. No additional qualifying criteria (e.g. presence of Annex I habitats or any other Annex II species) are listed for this designated site.

3.4. The SAC Citation and Natura 2000 Standard Data Form for Cannock Extension Canal SAC are included at Appendix 2. The citation for Cannock Extension Canal SSSI, which underpins the SAC designation, is included at Appendix 3.

Conservation Objectives

3.5. The conservation objectives for the Cannock Extension Canal SAC are defined by NE. These are the formal conservation objectives for the purpose of undertaking an assessment under Regulation 63 of the Habitats Regulations. A copy of the formal conservation objectives is included at Appendix 4.

3.6. The conservation objectives for the Cannock Extension Canal SAC are as follows:

> *"With regard to the SAC and the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below), and subject to natural change;*
>
> *Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:*
>
> - *The extent and distribution of the habitats of qualifying species;*
> - *The structure and function of the habitats of qualifying species;*

- *The supporting processes on the habitats of qualifying species rely;*
- *The populations of qualifying species; and*
- *The distribution of qualifying species within thesSite.*

Qualifying Features:

S1831. Luronium natans; Floating water-plantain

3.7. The formal objectives refer to an accompanying *Supplementary Advice* document, "*which provides more detailed advice and information to enable the application and achievement of the Objectives set out above*". This document was published in February 2019, and is also provided at Appendix 5.

3.8. The Supplementary Advice provides further detail on the qualifying features of the SAC, the habitats, and conditions within which the qualifying species is maintained and the site targets to ensure the conservation objectives are met. Reference is also made to the Site Improvement Plan (SIP) prepared for the site.

3.9. In addition, a SIP has been published for the SAC. This SIP provides a high level overview of the issues (both current and predicted) affecting the condition of the SAC features on the site(s) and outlines the priority measures required to improve the condition of the features. This document has been provided at Appendix 6. Specific consideration has again been given to this document as part of this iHRA.

Condition of SAC Habitats

3.10. Cannock Extension Canal SAC is underpinned by the Cannock Extension Canal SSSI. This SSSI is comprised of two Management Units, the closest of which, Unit 1, is listed as 'Unfavourable – Recovering' and Unit 2 listed as 'Favourable'.

3.11. The reason for the 'Unfavourable – Recovering' condition is not explicitly identified, however, commentary provided following the most recent NE Site check (12 November 2020) noted the prevalence of Floating Pennywort *Hydrocotyle ranunculoides* and Azolla *Azolla*. A revised management plan was anticipated to be produced within 12 months of the site visit. However, no such document is currently available. Remedial measures are likely to include introduction of weevils and dredging. NE have predicted the management unit to attain 'Favourable' status in 2029.

3.12. Favourable condition for the SSSI is defined as being adequately conserved and meeting its 'conservation objectives'.

Cannock Chase SAC

3.13. Cannock Chase SAC is situated approximately 7.5km to the north-west of the Site boundary at its closest point. This SAC is essentially a heathland site designated on account of its heath habitats.

SAC Qualifying Features

3.14. Cannock Chase SAC is classified as being of European level importance on account of supporting two heathland habitats: European Dry Heaths (listed as a primary reason for the selection of the site) and Northern Atlantic Wet Heaths with *Erica tetralix* (listed as a qualifying feature). For clarity *Erica* is commonly known as Cross-leaved Heath (a type of heather). No additional qualifying criteria (e.g. presence of Annex II species) are listed for this designated site.

3.15. The SAC citation and Natura 2000 Standard Data Form for Cannock Chase SAC is included at Appendix 7. The SSSI citation which underpins the SAC designation is included at Appendix 8.

Conservation Objectives

3.16. The conservation objectives for the Cannock Chase SAC are defined by NE. These are the formal conservation objectives for the purpose of undertaking an assessment under Regulation 63 of the Habitats Regulations. A copy of the formal conservation objectives is included at Appendix 9.

3.17. The conservation objectives for Cannock Chase SAC are as follows:

> *With regard to the SAC and the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below), and subject to natural change;*
>
> *Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:*
>
> - *The extent and distribution of qualifying natural habitats;*
> - *The structure and function (including typical species) of qualifying natural habitats; and;*
> - *The supporting processes on which qualifying natural habitats rely.*
>
> *Qualifying Features:*
>
> *H4010. Northern Atlantic wet heaths with Erica tetralix; Wet heathland with cross-leaved heath*
> *H4030. European dry heaths*

3.18. As with Cannock Extension Canal SAC, the formal objectives for Cannock Chase SAC also refer to an accompanying *Supplementary Advice* document. This document is now available, and a copy of is provided at Appendix 10.

3.19. The supplementary advice document for Cannock Chase clarifies the features of value within the European Site and provides a series of detailed management and monitoring 'targets' for the site. These targets have been

prepared with specific reference to the sites conservation objectives. Progress towards the targets will therefore contribute towards the sites conservation objectives being met.

3.20. Again, a SIP has been published for the SAC, and is provided at Appendix 11. Specific consideration has again been given to this document as part of this iHRA.

3.21. Cannock Chase SAC is underpinned by the Cannock Chase SSSI. This SSSI is comprised of thirty Management Units. Overall, two units (1.07%) are in 'Favourable' condition, the majority (90.23%) are in 'Unfavourable Recovering' condition, two units (2.76%) are in 'Unfavourable – No Change' condition and two units (5.94%) in 'Unfavourable – Declining' condition.

3.22. Those units closest to the Site are identified as 'Unfavourable Recovering' condition. The reason for the 'Unfavourable Recovering' condition in these closest units (2, 3, and 4) is primarily related to management, and relates to the extent of usable bare ground, as well as the need for bracken and tree control.

4. ASSESSMENT OF THE IMPLICATIONS OF THE DEVELOPMENT PROPOSALS FOR THE CONSERVATION OBJECTIVES OF RELEVANT SACS

4.1. Section 2 of this document sets out the legislation, guidance, and case law of relevance to an assessment of the implications of a plan/project on a European Site. Having regard to this legislation and supporting guidance, it is clear the assessment is a two-stage process, the first being the 'likely significant effect', and the second being the 'integrity test'.

4.2. It is clear the Conservation Objectives of a European Site are the most important consideration in determining whether the plan/project will have an adverse effect on the site, including any effects on its integrity. Indeed, some guidance indicates it is only the conservation objectives against which the plan/project should be tested in line with the Habitats Directive/Regulations. However, other European guidance implies that additional information is relevant.

4.3. It is evident there is a clear hierarchical approach to assessing effects on European Sites in line with the Habitats Directive/Regulations. The primary test is that against the conservation objectives (now updated to include specific reference to qualifying interest features), with other considerations following these. Such other considerations would include:

- Other features of interest associated with the site; and
- Other relevant baseline information for the site.

4.4. In line with the above, whilst the qualifying interest features of the site and other baseline information have informed this assessment, the greatest weight has been placed upon the formal Conservation Objectives for European Sites, as set out by NE. Consideration has also been afforded to the Supplementary Advice produced by NE, where relevant, as well as SIPs.

4.5. This Section includes a description of the potentially significant effects which could arise from development proposals at the Site on the integrity of both Cannock Extension Canal SAC and Cannock Chase SAC. Given the separation of other European Sites, potential impacts can be scoped out.

4.6. The potential effects are assessed within this Section in order to address the test under Regulation 63(1), in the first instance (the 'likely significant effect' stage). The assessment of potential significant effects is undertaken at this stage of the development proposals 'alone' (i.e. not 'in-combination').

4.7. In undertaking this assessment, consideration has been had to the best available scientific knowledge. Further consideration under the Habitats Regulations can therefore be undertaken consistent with the *Waddenzee* Judgement, which requires the use of the best scientific knowledge to inform a decision where no reasonable scientific doubt remains as to the presence and/or absence of effects that would adversely affect the integrity of the designated site (see Section 2 above).

4.8. Furthermore, consideration is given to the *People over Wind* Judgement, which confirmed the view of the CJEU that avoidance or mitigation measures can only be taken into consideration at the Appropriate

Assessment stage. This overrules the domestic *Dilly Lane* Judgement in the High Court (see Section 2 above).

4.9. As set out in Section 2, it is appropriate to distinguish between measures which are specifically "*intended to avoid or reduce the harmful effects"* (i.e. mitigation measures for the purposes of HRA) and measures which would come forward in any event (i.e. intrinsic elements of scheme design). Notwithstanding the latter measures may, by default, avoid or reduce harmful effects on a European Site(s), they are integral elements of a development proposal. It therefore remains appropriate to consider such measures at the first stage of the test (the 'Likely Significant Effect' stage) under Regulation 63.

4.10. The conservation objectives for the SACs, as supplied by NE, relate to avoiding deterioration and significant disturbance of species features and their associated habitats. At this first ('Likely Significant Effect') stage of the assessment, consideration is given to all potential significant effects on the designating features of the SACs. Consideration has been given to potential effects that could arise from the development of the Site for new employment uses.

4.11. It is noted that other sites, for example E10: Turf Field and E12: Site between A5 and M6 Toll, Norton Cranes, will also need to be tested against the Habitat Regulations, and will need to be considered on their individual merits. At a local plan level, Cannock Chase District Council will moreover need to consider the potential for cumulative impacts as would have the potential to arise through their preferred allocations. Consideration is therefore given to strategic policies or measures which could appropriately safeguard against potential adverse impacts from both plan and non-plan development.

Potential Effects on the Cannock Extension Canal SAC

4.12. Key to the consideration of likely significant effects on the Cannock Extension Canal SAC is the potential for the development proposals for the Site to result in adverse effects on 'Floating Water-plantain' for which the SAC is designated. It is the potential effects on this species (and its supporting habitat) which are of primary importance.

4.13. Consideration has been given to the following potential pathways which could impact on the SAC during construction or operation:

- Recreation/boat traffic;
- Dust deposition;
- Water pollution/hydrological contamination; and
- Air quality.

4.14. On the basis the SAC is designated on account of Floating Water-plantain, it is considered no impacts are likely to arise as a result of noise disturbance or lighting. Further consideration is given to the other potential impact pathways below.

Recreation/Boat Traffic

4.15. The level of boat traffic along the canal is the key factor affecting the population of Floating Water-plantain within the SAC, and this would not be affected by any development proposals at the Site, either during the construction or operational periods.

4.16. In any event, it is noted levels of boat traffic within the SAC are not identified as resulting in adverse impacts on the SAC at the current time. In any event, the Canal and Rivers Trust (CRT) undertake annual monitoring of boat traffic along the SAC in order to inform their on-going management of the site, as well as the frequency of required dredging works.

4.17. On the basis that emerging development proposals for the Site would be for employment use, it is not considered development would result in an increase in recreational pressure on adjacent land. In any event, given that Floating Water-plantain is a species restricted to aquatic environments (in this case the canal), it is considered that any increase in recreational pressure (such as along footpaths) would not be likely to result in any significant impacts on the SAC.

4.18. This same conclusion is also reached in the Cannock Chase Local Plan HRA Report[1] prepared in support of the Preferred Options Local Plan, in which it is stated that "*The only European Site that has been identified as sensitive to recreation and urban impacts is Cannock Chase SAC*".

Dust Deposition

4.19. In regards dust impacts, it is noted dust arising during construction work only has a significant impact within 20m due to heavy soiling of vegetation; further than that it is dispersed and of negligible significance. As noted previously, the closest proposed built form at the Site would be in excess of 120m from the SAC at its closest point.

4.20. As such, the potential for impacts to arise as a result of dust deposition is considered to be negligible. In any event, best engineering practice and protocols would be adopted during the construction works, adhering to current guidance and legislation, such as storing any aggregates a significant distance from the SAC, and spraying dry materials to limit airborne movement. The details of this strategy may be provided at the planning application stage, as part of a CMP, and secured via appropriate planning Conditions.

4.21. It is noted the Preferred Options Local Plan includes for a strategic policy (*Policy SO7.3: Special Areas of Conservation*) which secures the need for construction safeguards (such as in relation to dust) to be identified at the point of application for any development scheme. This wording, as reiterated below, provides a sufficient policy safeguard to protect against this potential impact pathway:

[1] Cannock Chase District Council, Cannock Chase Local Plan, HRA Report, Final report, Prepared by LUC March 2021

"Development will not be permitted where it would lead directly or indirectly to an adverse impact upon a Special Area of Conservation (SAC) and the effects cannot be mitigated.

The effective avoidance and/or mitigation of any identified adverse effects must be demonstrated to the Council as competent authority, and secured by means of a suitable mechanism (for example, a legal agreement) prior to the approval of the development."

Water Pollution/Hydrological Contamination

4.22. Given the proximity of the Site to the SAC, it is also considered that development proposals could, in the absence of mitigation, have an effect on the water quality of the SAC. Effects which could occur during the construction period include the risk of contaminants (such as oils or suspended solids) passing from the development Site into the canal.

4.23. In order to avoid potential impacts on water quality within the canal during the construction period, a suitable strategy will be employed to prevent any contaminants passing from the development Site into the canal. It is envisaged this strategy will involve measures including installation of interceptor fencing/bunds, provision of spill kits to machine operators, and agreed safe storage of all materials well away from watercourses, especially in the western part of the Site. In this regard, noting that no built form is proposed within 120m of the SAC, it is considered that no construction materials would be stored within 100m of the SAC. In any event, it is noted that the SAC is raised above the Site, effectively excluding any risk of surface water runoff or contamination.

4.24. Whilst the details of any strategy in this regard would need to be confirmed at the planning application stage (once a scheme has been finalised), adoption of measures such as these would ensure potential impacts on the SAC during construction would be fully mitigated.

4.25. As part of the emerging development proposals for the Site, detailed consideration will need to be given to the long-term drainage strategy, to prevent any flows from passing into the canal which could lead to an effect on the SAC. From initial desk study work undertaken in support of the emerging development proposals, a number of drainage options have been identified which could come forward in compliance with the environmental standards set out by the Water Framework Directive (WFD 2000/60/EC), ensuring potential impacts on the off-site Cannock Extension Canal are fully avoided.

4.26. In regards the operational phase, the surface water strategy for the Site is anticipated to include for the adoption of a three-stage treatment train, including the use of SUDS, to ensure any waters discharged from the Site will be cleaned to environmentally appropriate levels in accordance with CIRIA guidance. At this stage it is considered that gullies will be utilised to trap silt and oil, capturing any contaminants from the main development footprint, with grassed channels/swales and pools providing further vegetative treatment of surface waters in order to ensure water quality meets the appropriate regulatory standards prior to discharge off-site. The

adopted water treatment train would be maintained in-perpetuity to ensure it remains functional for the lifetime of the proposed development.

4.27. It is noted the above approach may offer a significant opportunity for betterment over the existing situation, with arable fields subject to unregulated chemical application, a proportion of which may discharge into the SAC. Indeed, the potential harm caused by agricultural management to water environments is well documented, and an evidence base collated by NE[2] indicates the conversion of agricultural land to built form within the watershed of sensitive aquatic sites (e.g. SACs) can achieve a substantive net reduction in nitrate or nitrogen leaching into watercourses.

4.28. Regarding the treatment of foul and storm water, this would be discharged to an identified Waste Water Treatment Works (WWTW) following confirmation of local capacity. Waste water will either be pumped, or a gravity system may be employed, depending on the results of further work to be undertaken at the detailed design stage.

4.29. In light of the above, it is considered that, subject to the adoption of an appropriately designed scheme, which could include features for on-site drainage attenuation and/or interceptor traps, as appropriate, any potential water quality impacts on the Cannock Extension Canal SAC during the construction and operational phases could be fully avoided or mitigated.

4.30. As set out above, these avoidance and mitigation measures would form an intrinsic element of the emerging development proposals for the Site (as opposed to being mitigation measures targeted at the SAC), and are essential to ensure compliance with wider water quality and nature conservation objectives, in line with adopted guidance and legislation.

4.31. Considering this potential impact pathway at a strategic level, it is noted that other plan or non-plan development within the water catchment of the Cannock Extension Canal SAC would also have the potential to give rise to potential adverse impacts in the absence of an appropriate drainage strategy. Indeed, this is recognised within the Preferred Options Local Plan and an appropriate policy safeguard is proposed to ensure no adverse effects on the integrity of SAC may arise. This policy wording (forming part of Policy SO7.3) is reiterated below:

"*Cannock Extension Canal SAC*

Any development within the water catchment area of the Cannock Extension Canal SAC will be deemed to have an adverse impact on the Cannock Extension Canal SAC. Mitigation for any identified adverse effects must be demonstrated and secured prior to approval of development and ongoing monitoring of impact on the SAC will be required.

Developments outside the water catchment area may be required to demonstrate that they will have no adverse effect on the integrity of the SAC."

[2] Advice on Achieving Nutrient Neutrality for New Development in the Solent Region. Natural England. June 2020. Version 5.

4.32. As above and in summary, the adoption of an appropriately designed drainage strategy as an intrinsic element of the proposals would ensure the measures for drainage would ensure potential water quality impacts on the Cannock Extension Canal SAC during the construction and operational phases could be fully avoided or mitigated.

4.33. It is noted that comparable measures would be required for all future development in the water catchment, with policy safeguards in place to secure these requirements at a strategic level.

Air Quality

4.34. Consideration has been given to the potential for adverse effects to arise on the SAC, either during the construction period or during operation, as a result of air quality impacts (e.g. through nitrogen deposition).

4.35. The Air Pollution Information System (APIS) website[3] includes information relevant to the assessment of air quality impacts (including nitrogen deposition) on European designated sites.

4.36. Threshold values for nutrient nitrogen deposition are expressed as a Critical Load. The Critical Load values are based on empirical evidence (e.g. observations from experiments and gradient studies) and are assigned to habitat classes of the European Nature Information System (EUNIS) to enable consistency of habitat terminology and understanding across Europe. They are given as ranges (e.g. 3 to 10 kgN/ha/yr for the Cannock Extension Canal). The ranges reflect variation in ecosystem response across Europe (i.e. a particular habitat may be shown to be more sensitive within one part of Europe than in another). On the APIS website, for each Critical Load an indication of the confidence in a cited Critical Load is given by an “uncertainty rating” (reliable, quite reliable and expert judgement).

4.37. Critical levels are also provided for NOx, with levels identified for both annual means and 24 hour means as well as ammonia.

4.38. In respect of Critical Loads, it is stated on the APIS website that (for the reasons summarised in paragraph 4.36 above) Critical Loads are supplied as a range and further, that the minimum of the range should be used for screening purposes (i.e. evidence has shown that above the minimum value, an impact could arise).

4.39. However, it is noted the range provided in this instance is assigned to the habitat type of ‘*Permanent oligotrophic waters: Softwater lakes*’, a habitat type that is, by definition, very nutrient poor. However, Floating Water-plantain is known to thrive in a wide range of freshwater habitats, including (as is the case at Cannock Extension Canal), waterbodies which support a higher nutrient content and are mesotrophic in nature. On this basis, it is important to note that APIS provides the following caveat alongside allocation of a critical load:

[3] APIS - Cannock Extension Canal SAC. Available at: http://www.apis.ac.uk/srcl/select-a-feature?Site=UK0012672&SiteType=SAC&submit=Next

> *"Seek Site specific advice for site value. This critical load only applies if the interest feature is associated with softwater oligotrophic or dystrophic lakes at the site. If the feature is not depending on these lake types, there is no comparable critical load available. The critical load for C1.1 and C1.4 is 3 to 10 kgNha-1yr-1. The lower end of the range is intended for boreal and alpine lakes, and the higher end of the range for Atlantic softwaters. Site specific advice should be sought from the conservation agencies as to which part of the range is relevant. Note that the critical load should only be applied to oligotrophic waters with low alkalinity with no significant agricultural or other human inputs".*

4.40. In line with this position, and in accordance with the stance adopted for the Habitat Regulations Assessment prepared for the North Warwickshire Local Plan (Incorporating Main Modifications Version)[4] (an approach which is understood to have been considered appropriate by NE), it is considered appropriate to assess the potential impacts of air quality on a site specific basis, giving due regard to the ecology and sensitivity of Floating Water-plantain.

4.41. Nonetheless, and in order to ensure this iHRA is informed by the best available scientific information, quantitative assessment work has been undertaken to inform the potential for air quality impacts as a result of the emerging development at the Site. Importantly, the assessment has been undertaken on a precautionary basis, adopting the maximum possible extent of development (50,000sqm), as well as the most trip heavy type of development (in this case 100% B8 development). An opening year of 2025 is also assumed, albeit in reality it is unlikely that the scheme would be fully operational by this time.

4.42. Taking figures provided on the APIS website, the current (2019) level of nutrient nitrogen deposition is calculated to be a maximum of 12.6 kgN/ha/yr. It is noted that the nitrogen deposition reduced significantly between 2018 and 2019 (previously being record as 17.8 kgN/ha/yr). As such, the current level of deposition already exceeds the maximum Critical Load value (as assigned for oligotrophic waters). Notwithstanding this, it is noted the condition of the underpinning SSSI's are either in 'Unfavourable – Recovering' condition or 'Favourable' condition.

4.43. These conditions mean all the necessary mechanisms are in place to either maintain the Site at a 'Favourable' Condition (where conservation objectives are being met) or otherwise restore the Site's condition to 'Favourable', ensuring that the Site is on a positive trajectory towards said condition. In turn, this indicates the current air quality levels are not resulting in any significant decline to the condition of the SAC (and therefore not materially impacting the sites conservation objectives). The condition of these SSSI's despite current nitrogen levels, provides further evidence that populations of Floating Water-plantain can be sustained at a 'Favourable' conservation status at the current baseline nutrient nitrogen, ammonia (NH3) and NOx levels. Indeed, even with the current levels,

[4] North Warwickshire Local Plan. Habitat Regulations Assessment Report, Local Plan Incorporating Main Modifications Version, February 2021

Natural England predict the entirety of the SAC to attain Favourable condition by 2029.

4.44. In support of this conclusion, whilst the SIP for the SAC identifies nitrogen deposition as a potential pressure at the SAC, it is not identified as a 'threat', and there is no evidence of harm arising through this pathway. Any increase which could occur as a result of development proposals at the Site would need to be considered in this light.

4.45. To inform the viability of the proposals, initial air quality assessment work has been undertaken at this early stage (see Appendix 12). The purpose of this assessment work was to identify whether the emerging development proposals at Watling Street have the potential to significantly impact Cannock Extension Canal SAC through increased air pollution, primarily as a result increased traffic along roads within 200m of the SAC (in this case the A5 and Lime Lane, B4154).

4.46. It has long been established, as accepted by NE, that so long as any increase in traffic emissions is demonstrably below 1% of the Critical Load threshold for relevant habitats at the European Site (in this case 0.03kgN/ha/yr when adopting a precautionary approach), then no significant adverse effects on the integrity of the designated site would be likely. Where the 1% threshold is exceeded however, further assessment work is required in consideration of the Habitat Regulations to confirm whether or not such impacts are 'significant'.

4.47. The assessment work undertaken at Watling Street has identified the emerging proposals would likely result in the exceedance of the 1% threshold for nitrogen deposition in small areas of the SAC which lies directly adjacent to the A5 road.

4.48. It is pertinent to note that any nitrogen and ammonia deposition within very small areas of the SAC would be diluted within a very large volume of water supported within the wider Cannock Extension Canal SAC.

4.49. In regards NOx concentrations the assessment work predicts an increase in annual mean NOx concentrations above 1% of the annual NOx Critical Level, albeit only within an area at the northernmost tip of the SAC (which is within the Site boundary, but not in the area of open water) and immediately adjacent the B4154 bridge crossing. It is noted that contrary to Critical Loads, critical levels for NOx are assigned to the broad habitat type of '*Standing open water and canals'*. Again, it is relevant to note that NOx deposition within very small areas of the SAC would be diluted within a very large volume of water supported within the wider Cannock Extension Canal SAC.

4.50. Given the 1% Critical Load for nitrogen deposition, as well as the 1% Critical Levels for ammonia and NOx threshold would be exceeded (albeit in only a very small area of the SAC) further consideration is nonetheless given to this matter, on a precautionary basis, to determine whether these impacts would have a significant impact on the Cannock Extension Canal SAC. In undertaking this further assessment work, careful consideration has been given to the conservation objectives for the SAC. The areas of the SAC in which the threshold is exceeded is detailed at Appendix 12.

4.51. As noted above, the aquatic habitats within Cannock Extension Canal SAC would not be considered oligotrophic, but mesotrophic. Indeed, despite a level of nitrogen deposition significantly above the Critical Load value identified for the SAC (i.e. a maximum deposition rate of 12.6 kgN/ha/yr) the SSSI/SAC is identified to be either in 'Favourable' or 'Recovering' condition. This indicates current air quality levels are not resulting in any decline to the condition of the SAC or its ability to maintain or restore the habitats and species to a 'Favourable' conservation status.

4.52. In line with the approach adopted within the North Warwickshire Local Plan HRA, consideration has also been given to the ecological requirements of Floating Water-plantain, the range of trophic levels at which it can persist, and the biotic and abiotic conditions which form the baseline situation at the Cannock Extension Canal SAC. As above, the canal is considered to comprise a mesotrophic waterbody, not least given the diverse macrophyte communities identified to be sustained within the SSSI. It is further noted that water quality targets set for the SAC within the Supplementary Advice document identify targets (for example in relation to phosphorous) based on mesotrophic waterbodies.

4.53. Floating Water-plantain is a poor competitor, and therefore may be susceptible to being outcompeted in more nutrient rich waters. Both nitrogen and phosphorous are required for aquatic plant growth. However, within mesotrophic waterbodies such as Cannock Extension Canal SAC, it is phosphorous that is typically considered to be the limiting factor in plant growth, given the presence of nitrogen fixing cyanobacteria which sequester atmospheric nitrogen[5]. To this end it is noted the Supplementary Guidance document for the SAC currently includes for targets to maintain phosphorus concentrations at or below appropriate levels.

4.54. Noting the broad range of trophic conditions in which Floating Water-plantain can thrive, that aquatic habitats tend to be less sensitive to nitrogen deposition, and measures are already in place to monitor and manage phosphorous levels, it is not considered there is potential for air quality impacts to arise on the Cannock Extension Canal SAC.

4.55. In support of this conclusion, the Cannock Extension Canal SIP, Conservation Objectives Supplementary Guidance nor the SSSI unit condition assessments identify air quality impacts to be giving rise to potential adverse impacts on the Cannock Extension Canal SAC. Moreover, even reflecting the current deposition rates, Natural England assess the entirety of the SAC to achieve Favourable condition by 2029.

4.56. Moreover, and as further considered within the 'in-combination assessment' section below, any increases in deposition as a result of the proposals (considered relative to a no-development scenario at the Site) would be more than out-weighed by overall improvements in air quality during the assessment period.

[5] Dodds, W.K. and Smith, V.H. (2016) Nitrogen, phosphorus, and eutrophication in streams. Inland Waters Vol. 6, pp. 155-164

4.57. Indeed, modelling undertaken in respect of the emerging proposals has identified that both nitrogen concentration and deposition rates would be lower at all modelled receptor locations relative to the pre-existing (2019) base line. This 'improvement' is primarily a result of the trend towards cleaner engines in modern vehicles.

4.58. As no impacts are considered to arise, no specific mitigation would be required for the development when considered alone. Nonetheless, it is noted the introduction of more stringent emissions standards, as imposed by European legislation, as well as the national move towards electric vehicles, offers a strategic approach to reducing pollutants at a national scale. Such measures are likely to prevent future declines to air quality within the proximity of the Cannock Extension Canal SAC in future years, irrespective of the proposals.

4.59. This assessment demonstrates the proposals, when considered alone, would avoid potential adverse impacts on Cannock Extension Canal SAC. However, at a strategic level, Cannock Chase District Council will need to consider cumulative air quality impacts which may arise from their Preferred Options Local Plan in combination with other plans and projects of relevance.

4.60. In this regard, it is noted the proposals at Watling Street would account for only a very small contribution towards overall traffic generation (and therefore changes in N, NOx and ammonia deposition) in the plan period. This level of traffic generated from the Site would be comparable to other developments of the same scale, and which use the A5 as a primary traffic route, such as Turf Field, Watling Street.

4.61. The requirement for a strategic assessment of potential air quality impacts as part of the Local Plan process is also identified within the HRA report prepared in support of the Cannock Chase Local Plan Preferred Options. Noting the above, further consideration is given to strategic and policy based safeguards in the 'In-Combination Effects' Section below.

Summary

4.62. In summary, specific consideration has been given to the potential for adverse impacts to arise on the Cannock Extension Canal as a result of the emerging development proposals.

4.63. In regards the potential for air pollution impacts, detailed assessment work has identified that only very small sections of the SAC which lie directly adjacent to either the A5 or the Lime Lane (B4154) bridge over the SAC, would experience increases in nitrogen, ammonia or NOx deposition marginally in excess of the 1% Critical Load threshold. It is noted that any deposition within these area would be diluted within a very large volume of water supported within the wider Cannock Extension Canal SAC.

4.64. Notwithstanding these very minor increases in deposition would arise, a Site specific assessment has found no evidence to indicate current levels are resulting in harm to the SAC. Importantly, this was the case even when considering the significantly higher deposition rates that have been recorded at the site in previous years (with an annual declining trend in

ammonia, nitrogen and NOx having been recorded between 2018 and 2019).

4.65. Indeed, within mesotrophic waterbodies such as Cannock Extension Canal SAC, it is phosphorous, not nitrogen, that is typically considered to be the limiting factor in plant growth (which in turn could result in Floating Water-plantain being outcompeted). To this end it is noted the Supplementary Guidance document for the SAC currently includes for targets to maintain phosphorus concentrations at or below appropriate levels.

4.66. Noting the above, and the very minor changes in nitrogen which would arise, that in any event Floating Water-plantain thrives in a broad range of trophic conditions, that measures are already in place to monitor and manage phosphorous levels (this being the factor considered to limit plant growth at the SAC), it is not considered there is potential for adverse air quality impacts to arise on the Cannock Extension Canal SAC. On this basis, no mitigation would be required for the development alone.

4.67. In regards the potential for other impacts, subject to the adoption of appropriate avoidance and mitigation measures, which would be similar to those outlined above (i.e. paragraphs 4.19-4.33 of this HRA), development proposals at the Site would not be likely to result in any adverse effects on Cannock Extension Canal SAC.

Potential Effects on the Cannock Chase SAC

4.68. Cannock Chase SAC is separated from the Site by a significant distance, with the SAC approximately 7.5km away from the Site boundary at its closest point. On this basis it is considered there would be no potential for likely significant effects on this site to arise during the construction phase of any development at the Site, such as through noise, lighting, dust deposition or air quality, for example.

4.69. Furthermore, it is considered that any proposals for new employment development would not be likely to give rise to potential effects during the operational phase (such as an increase in recreational pressure).

4.70. On this basis, no avoidance or mitigation measures would be required, and it may be safely concluded that development proposals at the Site would not be likely to result in any adverse effects on Cannock Chase SAC when considered alone.

4.71. As above, at a strategic level, Cannock Chase District Council will need to consider cumulative air quality impacts which may arise from their Preferred Options Local Plan in combination with other plans and projects of relevance. Any contribution to traffic (and associated nitrogen deposition) along relevant roads (i.e. those within 200m of the Cannock Chase SAC) as a result of development at the Watling Street Site would be miniscule, not least given the Site's distance from the SAC and its location next to the primary road network (minimising the likelihood of traffic passing Cannock Chase SAC).

In-Combination Effects

4.72. Potential air quality impacts, when considered alone, would not have any significant impacts on European Sites. However, the Wealden Judgment makes clear the need for an in-combination assessment with regard to other relevant plans or projects. This point is of pertinence both to the current proposals, and indeed any other sites being considered for allocation as part of the emerging Local Plan.

4.73. With regards to air quality, specific assessment has concluded that adverse air quality impacts would not arise on Cannock Extension Canal as a result of the emerging development proposals when considered alone.

4.74. It is important to note that the air quality assessment undertaken for the Site accounts for existing development and traffic of relevance to air quality at the SAC, including predicted trends up to 2025 (the assumed opening year). This assessment work has therefore allowed for an in-combination assessment to be undertaken which considers the emerging proposals at Watling Street against the cumulative impacts of existing developments and predicted (generic traffic growth) in the area.

4.75. As detailed above, and with regard the site specific assessment above, potential adverse impacts on Cannock Extension Canal SAC are not predicted when considered alone. However, at a strategic level, Cannock Chase District Council will need to consider cumulative air quality impacts which may arise from their Preferred Options Local Plan in combination with other plans and projects of relevance.

4.76. At the current time, for the reasons set out above, there is no evidence to indicate traffic related air quality impacts, as may arise through the emerging Local Plan, would result in adverse impacts on the Cannock Extension Canal SAC. This conclusion is based on a site based assessment which concludes that changes in nitrogen are not deemed likely to result in aquatic plant growth (eutrophication) at the Cannock Extension Canal SAC. Indeed, it is widely accepted that phosphorous is the limiting factor for plant growth in mesotrophic freshwater systems (such as the Cannock Extension Canal SAC). It is noted this same conclusion was reached within the North Warwickshire Local Plan HRA, for which traffic modelling data was not available, with this assessment concluding:

"On the basis of the available information it is considered that while planned growth is expected to significantly increase traffic on the A5 over the plan period, those increases will result in very little N deposition within the SAC due to the prevailing winds. Any small amount of N deposition would be diluted within the canal and would therefore be unlikely to alter the trophic conditions of the SAC, particularly compared to more significant influences such as sediment inputs from surface water flows. The qualifying feature (Luronium natans) is also understood to be relatively tolerant to changes in N levels and it also is expected that P is the limiting nutrient within this waterbody, therefore any small increases in N levels within the SAC as a result of aerial deposition are unlikely to result in changes to the population and distribution of the qualifying feature itself, or the structure, function, extent, distribution and supporting process of the habitat of the qualifying

feature. In addition, policies within the Plan itself that promote sustainable transport are expected to help minimise any increase in traffic on the A5."

4.77. The rational set out above is equally applicable to the emerging Cannock Chase Local Plan. Moreover, and similar to the North Warwickshire Local Plan, the Cannock Chase Preferred Options Local Plan also includes for policies to promote sustainable transport and minimise vehicle journeys, with Policies SO4.4 (Live Work Units), SO5.2 (Communication Technologies), SO5.3 (Low and Zero Carbon Transport) and SO5.4 (Maintaining and Improving the Transport System) being of particular relevance.

4.78. As a further policy safeguard, Local Plan policies SO7.1 (Protecting and Enhancing the Natural Environment) and SO7.3 (Special Areas of Conservation) further require developments to avoid direct or indirect impacts on SACs. The avoidance of potential impacts is required to be demonstrated as part of the planning process.

4.79. It is further of relevance to note the identified trend towards 'cleaner' vehicles (as underpinned by legislation) offers a strategic approach to reducing pollutants at a national scale. These measures in turn are likely to prevent future declines to air quality both nationally and locally. Indeed, specific modelling work undertaken in relation to the emerging development proposals has identified that, even accounting for the proposed development alongside predicted (generic) traffic growth, there would be an overall improvement in deposition rates. For clarity, the combined impact of the development and generic traffic growth would be less than the future (net) improvement offset at any location within the SAC.

4.80. In this light, the effect of the proposals with regard to nutrient nitrogen, ammonia and NOx, when considered in combination, can be considered to represent a very minor retardation of overall levels of improvement. Taking into account the precautionary approach which has been adopted at all levels within this assessment, it can therefore be concluded that there is no potential for adverse ecological effects to arise upon Cannock Extension Canal SAC, either when the development proposals are considered alone or in combination.

4.81. Noting all the above, that the proposals alone would avoid adverse impacts on the Cannock Extension Canal SAC, that there is no evidence to indicate harm as a result of air quality impacts at a strategic level, and that a series of strategic policies are in place to provide a further safeguard (all of which the Watling Street proposals may accord with), it is considered the emerging proposals at Watling Street could be safely allocated as part of a wider, legally compliant Local Plan, in line with the provisions of the Habitat Regulations.

4.82. Moreover, on the basis of the considerable distance between Cannock Chase SAC and the Site at Watling Street, it is considered that any air quality impacts arising from the emerging development proposals would be miniscule in nature, not least given the Site's location next to the primary road network (minimising the likelihood of traffic passing Cannock Chase SAC). In this regard, whilst the Local Plan process would need to include a full assessment of this impact pathway in due course, any traffic

contribution, as a result of development at Watling Street, would likely be minor and would not impact the overall acceptability of the Local Plan.

4.83. In relation to other potential pathways for impact (such as water quality issues or dust deposition), it is considered that, subject to the adoption of appropriate measures as outlined in the paragraphs above, any residual impacts on Cannock Extension Canal SAC or Cannock Chase SAC would be *nugatory* in nature.

4.84. Nonetheless, consideration has been given to further strategic policies which would ensure the proposals at the Site can come forward, as part of a wider Local Plan, whilst fully safeguarding European Sites (Habitats Sites).

4.85. As such any development proposals for the Site would not result in any other impacts on these SACs when considered in combination with other plans or projects.

Consideration of Regulation 105

4.86. The competent authority, when looking at its own plan, will do so under the tests of Regulation 105 of the Habitat Regulations. At the time of bringing forward this plan, the authority will need to consider the combined impacts of its preferred allocations under the auspices of Regulation 105.

4.87. In light of the assessment work undertaken as part of this current iHRA, it is considered the proposed allocation at Watling Street could safely form a component project of the emerging Cannock Chase Local Plan, compliant with Regulation 105 of the Habitat Regulations 2017.

4.88. Indeed, the measures set out in this report fully accord with the strategic safeguards detailed within the HRA produced for the Preferred Options Local Plan, ensuring they may come forward as part of a safe, legally compliant plan in due course.

Summary

4.89. In summary, specific consideration has been given to the potential for adverse impacts to arise on the Cannock Extension Canal SAC and Cannock Chase SAC as a result of the emerging development proposals.

4.90. In regards Cannock Chase SAC, given its separation from the Site at Watling Street, it is considered that all potential impact pathways, with the exception of air quality, can be immediately scoped out. Regarding air quality, given the Site's separation from the SAC (7.5km) and its proximity to the primary road network (which will minimise traffic generation on roads within 200m of the SAC) potential air quality impacts in isolation would be miniscule (i.e. not significant).

4.91. As stated in the HRA prepared in support of the Preferred Options Local Plan, a full (in-combination) assessment of this impact pathway will be required in due course. Nonetheless, any traffic contribution, as a result of development at Watling Street, would likely be exceedingly minor and would not impact the overall acceptability of the Local Plan.

4.92. Considering Cannock Extension Canal SAC, residual impacts, as a result of recreation, dust deposition or water quality issues, would be *nugatory* and as such no in-combination impacts would arise.

4.93. In regard to the potential for air pollution impacts, detailed assessment work has identified very small sections of the SAC would experience increases in nitrogen, ammonia and NOx deposition marginally in excess of the 1% Critical Load threshold, relative to a no-development scenario at the site. However, a Site specific assessment has found no evidence to indicate current levels are resulting in harm to the SAC, and indeed it is concluded it is other factors (primarily phosphorous levels) which would have the potential to impact plant growth or cause eutrophication at the SAC.

4.94. In any event, even accounting for the emerging development proposals alongside predicted traffic growth, there would be an overall improvement in deposition rates given a wider trend towards cleaner engines in modern vehicles. In other words, the effect of the proposals with regard to nutrient nitrogen, ammonia and NOx, when considered in combination with generic traffic growth, can be considered to represent a very minor retardation of overall levels of improvement. Considering these two factors together with the fact that current (higher) air quality levels are not identified to be resulting in harm to the SAC (with the SAC either in favourable condition or on a positive trajectory towards a favourable condition), it is axiomatic that no adverse impacts would have the potential to arise. This is the case either alone or in combination with other plans or projects.

4.95. Notwithstanding the above, precautionary strategic policies are nonetheless identified to minimise new traffic generation in any event, it is considered potential significant effects on the SAC can be avoided, both alone and in combination with other plans and projects.

4.96. The competent authority, when looking at its own plan, will do so under the tests of Regulation 105 of the Habitat Regulations. At the time of bringing forward this plan, the authority will need to consider the combined impacts of its preferred allocations under the auspices of Regulation 105.

4.97. In light of the assessment work undertaken as part of this current HRA, it is considered the proposed allocation at Watling Street could safely form a component project of the emerging Cannock Chase Local Plan, compliant with Regulation 105 of the Habitat Regulations 2017.

4.98. Indeed, the measures set out in this report fully accord with the strategic safeguards detailed within the HRA produced for the Preferred Options Local Plan, ensuring they may come forward as part of a safe, legally compliant plan in due course.

4.99. It is therefore considered that Cannock Chase District Council would be able to conclude that the development of Land off Watling Street, Cannock would not be likely to result in any potential significant effects on European Sites, and therefore the Site may be safely allocated for development in the Local Plan.

5. SUMMARY AND CONCLUSIONS

5.1. Ecology Solutions was commissioned by St Modwen to undertake ecological assessment work in respect of Land off Watling Street, Cannock.

5.2. This report sets out the relevant legislation, case law and guidance of direct relevance to consideration of potential impacts on Cannock Extension Canal SAC and Cannock Chase SAC, together with an assessment of the potential significant effects of development at the Site.

5.3. A broad level assessment of development proposals for the Site identifies that, in the absence of mitigation, proposals could result in a potential effect on Cannock Extension Canal SAC, primarily as a result of water quality impacts and dust deposition during construction and operation.

5.4. Through the adoption of best practice and appropriate mitigation measures during construction, it is considered these potential effects may be fully mitigated. Adoption of a suitable drainage strategy for the Site would also ensure proposals for the Site avoid potential impacts on the SAC during the operational phase.

5.5. In regards air quality impacts, and assuming the delivery of the scheme, a betterment of air quality is predicted by 2025. Given that the SAC is already in recovering condition despite the higher levels of nitrogen deposition currently observed, it is clear that a scheme delivered alongside betterment of air quality (i.e. a reduction in NOx and nitrogen deposition within the SAC) would have no significant impact on the SAC, either alone or in combination with other plans or projects.

5.6. Given that Cannock Chase SAC is situated approximately 7.5km from the Site boundary at its closest point, and that the development proposals for the Site are for employment uses, there is no potential likely significant effects that could arise during either the construction or operational phases, when considered alone. In due course, HRA work undertaken in support of the Local Plan process will need to undertake an in-combination assessment of traffic related air quality impacts. Nonetheless, any traffic contribution, as a result of development at Watling Street, would likely be exceedingly minor and would not impact the overall acceptability of the Local Plan.

5.7. In summary, assessment work undertaken has identified the emerging proposals for the Site at Watling Street could come forward without resulting in any likely adverse impacts on any European Sites, either alone or in combination with existing plans or projects (i.e. impacts would be *nugatory* or positive).

5.8. In due course, the competent authority, when looking at its emerging plan, will need to consider the combined impacts of its preferred allocations under the auspices of Regulation 105.

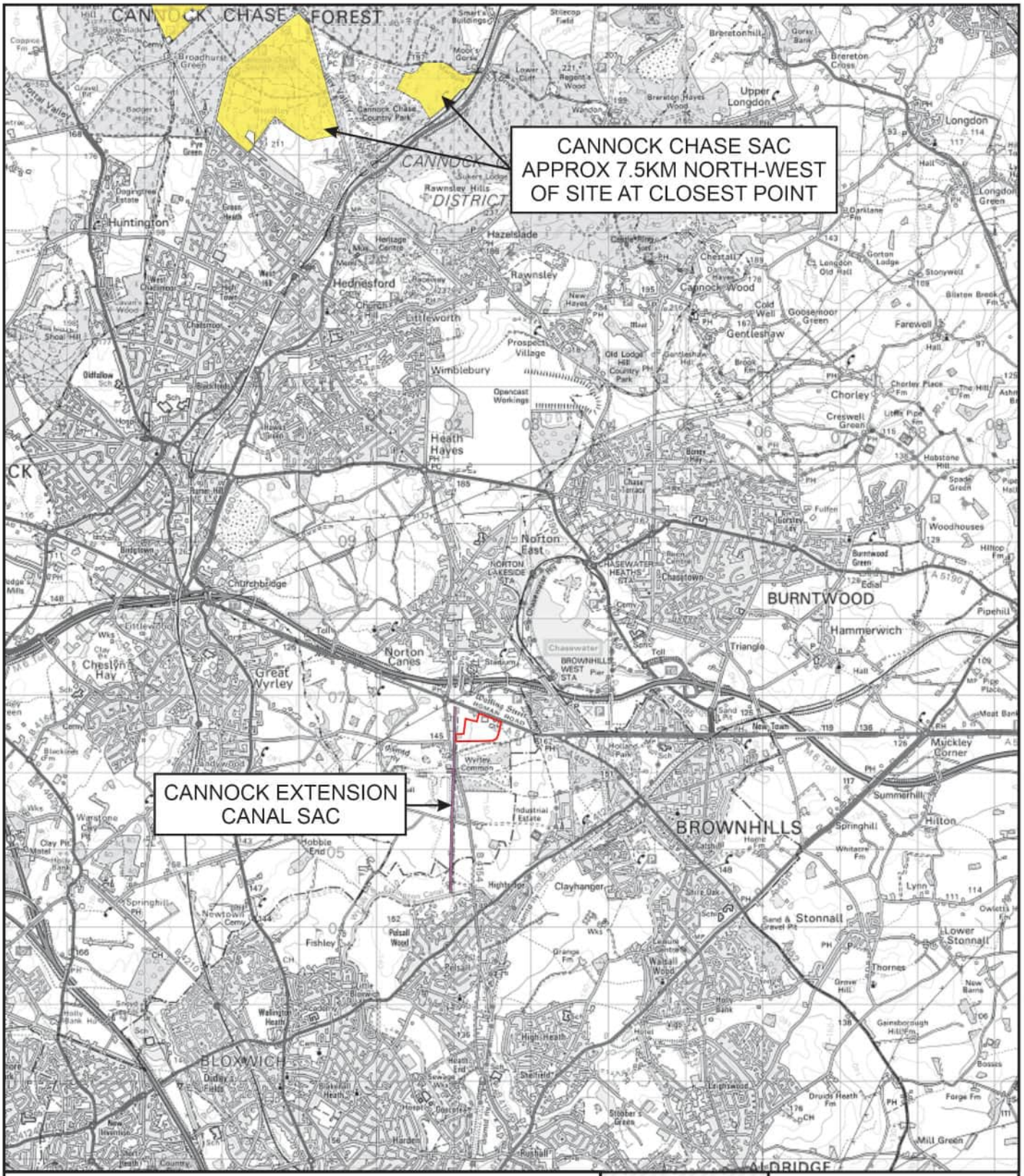
5.9. In light of the assessment work undertaken as part of this current HRA, it is considered the proposed allocation at Watling Street could safely form a component project of the emerging Cannock Chase Local Plan, compliant with Regulation 105 of the Habitat Regulations 2017.

5.10. Based on the evidence and assessment work set out in this current HRA document, it is considered the competent authority could legally and safely allocate the Site at Watling Street for E(g)(iii), B2 and/or B8 development in the emerging development framework, in line with the provisions and tests set out in the Regulations.

PLANS

PLAN ECO1

Relationship between the Site, Cannock Extension Canal SAC and Cannock Chase SAC



KEY:

- SITE BOUNDARY
- CANNOCK EXTENSION CANAL SAC
- CANNOCK CHASE SAC

N

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ecologysolutions.co.uk

6903: WATLING STREET, CANNOCK

PLAN ECO1: RELATIONSHIP BETWEEN THE SITE, CANNOCK EXTENSION CANAL SAC AND CANNOCK CHASE SAC

Rev: A

July 2021

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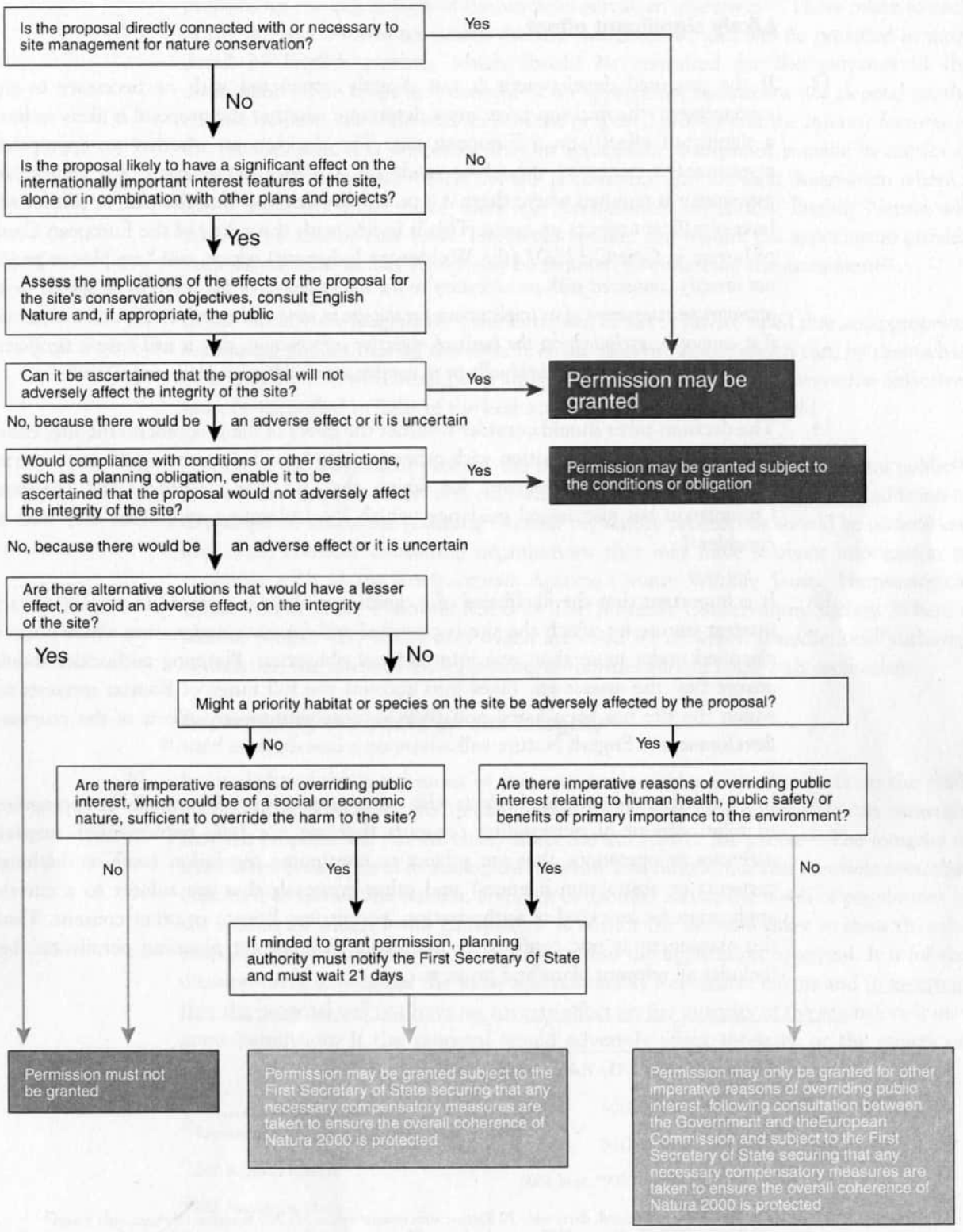
APPENDICES

APPENDIX 1

Flow Diagram from ODPM/Defra Circular

Figure 1: **Consideration of development proposals affecting Internationally Designated Nature Conservation Sites**



APPENDIX 2

Cannock Extension Canal SAC Citation and Natura 2000 Standard Data Form

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Cannock Extension Canal
Unitary Authority/County:	Walsall, Staffordshire
SAC status:	Designated on 1 April 2005
Grid reference:	SK020058
SAC EU code:	UK0012672
Area (ha):	5.47
Component SSSI:	Cannock Extension Canal SSSI

Site description:
Cannock Extension Canal in central England is an example of anthropogenic, lowland habitat supporting floating water-plantain *Luronium natans* at the eastern limit of the plant's natural distribution in England. A very large population of the species occurs in the Canal, which has a diverse aquatic flora and rich dragonfly fauna, indicative of good water quality. The low volume of boat traffic on this terminal branch of the Wyrley and Essington Canal has allowed open-water plants, including floating water-plantain, to flourish, while depressing the growth of emergents.

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following species listed in Annex II:

- Floating water-plantain *Luronium natans*

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0012672
Date of registration: 14 June 2005
Signed: Trevor Salmon
On behalf of the Secretary of State for Environment, Food and Rural Affairs

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 **UK0012672**

SITENAME **Cannock Extension Canal**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0012672

1.3 Site name

Cannock Extension Canal

1.4 First Compilation date	1.5 Update date
1995-06	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:	1995-06
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

Back to top

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-1.970555556	52.64972222

2.2 Area [ha]:

5.0

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
UKG2	Shropshire and Staffordshire
UKG3	West Midlands

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
P	1831	Luronium natans			p				C	DD	C	B	B	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **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); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	4.9
N06	75.0
N10	10.0
N23	10.1
Total Habitat Cover	100

Other Site Characteristics

2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Luronium natans 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	H02		B
H	I01		B
H	H04		B
H	A04		I

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

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

APPENDIX 3

Cannock Extension Canal SSSI Citation

COUNTY: STAFFORDSHIRE, WEST MIDLANDS

SITE NAME: CANNOCK EXTENSION CANAL

DISTRICT: Cannock Chase Walsall

SITE REF: 15W2L

Status: Site of Special Scientific Interest (SSSI) notified (Under Section 28 of the Wildlife and Countryside Act) 1981 as amended.

Local Planning Authority: STAFFORDSHIRE COUNTY COUNCIL, Cannock Chase District Council, Walsall Metropolitan Borough Council

National Grid Reference: SK 019044, SK 020069 Area: 5.47 (ha.) 13.5 (ac.)

Ordnance Survey Sheet 1:50,000: 139 1:10,000: SK 00 NW, SK 00 SW

Date Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 25 March 1993 Date of Last Revision: –

Other Information:
New site.

Description and Reasons for Notification:
The Cannock Extension is a terminal side branch of the Wyrley and Essington Canal extending northwards for 2.5 km towards Norton Canes. It is part of the extensive inland waterway system running throughout Birmingham and the Black Country. The high water quality, uneven canal bottom and the low volume of boat traffic have allowed a diverse aquatic flora to develop without any extensive reedswamp incursion.

A total of thirty four aquatic plants have been recorded from the canal, making it the richest known waterway of its type in Staffordshire and the West Midlands, and placing it high within the national canal network series.

Of major importance is a large population of the nationally scarce floating water-plantain *Luronium natans*, the best known colony in both Staffordshire and the West Midlands. This plant, recognised as endangered in Europe, is found throughout the length of the Cannock Extension. Good populations also exist of flowering-rush *Butomus umbellatus*, arrowhead *Sagittaria sagittifolia*, shining pondweed *Potamogeton lucens*, perfoliate pondweed *P. perfoliatus* and spiked water-milfoil *Myriophyllum spicatum*, all of which are rare or uncommon in Staffordshire. Other uncommon species present include curled pondweed *P. crispus* and narrow-leaved water-plantain *Alisma lanceolatum*.

The eastern canal bank is brick-edged with several species including hemlock water-dropwort *Oenanthe crocata*, skullcap *Scutellaria galericulata*, fairy flax *Linum catharticum* and water dock *Rumex hydrolapathum*, growing out of the brickwork. The towpath itself supports such species as common spotted-orchid *Dactylorhiza fuchsii* and greater bird's-foot-trefoil *Lotus uliginosus*. The western bank is much more natural with reed sweet-grass *Glyceria maxima* and branched bur-reed *Sparganium erectum* forming extensive marginal stands. Yellow iris *Iris pseudacorus* and yellow loosestrife *Lysimachia vulgaris* add to the diversity of this community.

At least nine species of dragonfly have been recorded in association with the canal, including the red-eyed damselfly *Erythromma najas* and emperor dragonfly *Anax imperator*, the latter species being at the northern edge of its range in Britain.

APPENDIX 4

European Site Conservation Objectives for Cannock Extension Canal SAC

European Site Conservation Objectives for Cannock Extension Canal Special Area of Conservation Site Code: UK0012672

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

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

- **The extent and distribution of the habitats of qualifying species**
- **The structure and function of the habitats of qualifying species**
- **The supporting processes on the habitats of qualifying species rely**
- **The populations of qualifying species, and,**
- **The distribution of qualifying species within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

S1831. *Luronium natans*; Floating water-plantain

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features as required by the provisions of Article 6(1) and 6(2) of the Directive.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in Article 1 of the Habitats Directive.

Publication date: 30 June 2014 – version 2. This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014.

APPENDIX 5

Conservation Objectives Supplementary Advice for
Cannock Extension Canal SAC

European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

Cannock Extension Canal Special Area of Conservation (SAC)
Site Code: UK0012672

Photograph: Natural England.

Date of Publication: 26 February 2018

About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Cannock Extension Canal SAC. This advice should therefore be read together with the SAC Conservation Objectives available here.

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site. You may also find it helpful to refer to Natural England's SSSI Impact Risk Zones dataset available here.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Cannock Extension Canal Special Area of Conservation (SAC)
Location	Staffordshire (SK0198205556)
Site Maps	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	01 April 2005
Qualifying Features	Floating water-plantain *Luronium natans*
Designation Area	5.47ha
Designation Changes	None
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Cannock Extension Canal SSSI
Relationship with other European or International Site designations	None
Other information	Natura 2000 Standard Data Form for Cannock Extension Canal SAC

Site background and geography

The Cannock Extension Canal in central England is an example of anthropogenic, lowland habitat supporting floating water-plantain *Luronium natans* at the eastern limit of the plant's natural distribution on England.

The Cannock Extension Canal was dug in 1863 for transportation of coal, which was the main industry in the area at the time, and is a terminal side branch of the Wyrley and Essington Canal extending northwards for 2.5 km towards Norton Canes. It is part of the extensive inland waterway system running throughout Birmingham and the Black Country.

The canal is fed by Chasewater Reservoir SSSI that lies approximately 8km to the north-east. The high water quality of the canal is due to the wider catchment of its feeder reservoir comprising semi-natural habitat such as heathland at Cuckoo Bank. There is little intensive agriculture in the catchment so water quality is good.

The high water quality, uneven canal bottom and the low volume of boat traffic have allowed a diverse aquatic flora to develop without any extensive reed-swamp incursion. The good water quality, low in plant nutrients, prevents dominant species such as reedmace, filamentous algae and invasive alien species such as *Elodea* species from dominating.

The large population of the nationally scarce floating water-plantain *Luronium natans*, found throughout the length of the canal, often carpeting it in places, is the best known colony in both Staffordshire and the West Midlands, and is considered to be one of the best areas in the United Kingdom for the species. In addition, a total of 34 aquatic plants have been recorded from the canal, making it the richest known waterway of its type in Staffordshire and the West Midlands and placing it high within the national canal network series.

In addition, good populations exist of flowering-rush *Butomus umbellatus*, arrowhead *Sagittaria sagittifolia*, shining pondweed *Potamogeton lucens*, perfoliate pondweed *P. perfoliatus* and spiked water-milfoil *Myriophyllum spicatum*, all of which are rare or uncommon in Staffordshire. Other uncommon species present include curled pondweed *P. crispus* and narrow-leaved water-plantain *Alisma lanceolatum*.

The canal is part of the navigable canal network and is home to a number of moorees mainly at the northern end. The canal is fished but not stocked. The canal is easily accessible from the communities at Pelsall and Norton Canes.

The Cannock Extension Canal has a variety of land uses adjacent to it. At the southern end of the SAC at the junction with the main Wyrley and Essington Canal the Extension Canal cuts through Pelsall Common Local Nature Reserve for about a fifth of its length, where a mosaic of heathland, woodland, wetland and grassland protects and complements the high nature value of the canal. Moving northwards, the adjacent land use changes to arable agriculture on both sides for about half of its length to the north. Moving further north, other land uses are a restored (and sealed) refuse tip, boatyard and moorings on the offside and woodland, fishing pool and arable agriculture on the tow-path side up to the A5 trunk road at the very north of the site.

The canal's tow-path forms the eastern boundary and has a wooded boundary for most of its length. The offside is also wooded in places and the trees overhang the canal; work has been carried out to crown lift several to reduce the shade and leaf litter, which would accumulate and smother the vegetation growing on the bed of the canal, such as the floating water-plantain *Luronium natans*.

There are drains into the canal from adjacent land, including one from Wyrley Common, which contains colliery shale waste in the water, and has led to a build-up of very fine sediment in the central section of the canal, which is slow to settle out once disturbed by boat traffic.

About the qualifying features of the SAC

The following section gives you additional, site-specific information about this SAC's qualifying features. These are the natural habitats and/or species for which this SAC has been designated.

Qualifying Species:

- **S1831 Floating water-plantain *Luronium natans***

Floating water-plantain *Luronium natans* occurs in a range of freshwater situations, including nutrient-poor lakes in the uplands and slowly-flowing lowland rivers, pools, ditches and canals that are moderately nutrient-rich.

Floating water-plantain *Luronium natans* occurs as two forms: in shallow water with floating oval leaves, and in deep water with submerged rosettes of narrow leaves. The plant thrives best in open situations with a moderate degree of disturbance, where the growth of emergent vegetation is held in check. Populations fluctuate greatly in size, often increasing when water levels drop to expose the bottom of the water body.

Floating water-plantain *Luronium natans* can grow in two different forms; perennial vegetative populations and many perennial flowering populations of floating water-plantain *Luronium natans* occur as persistent, largely stable populations in deep water. Perennial flowering populations in naturally

meso-eutrophic habitats are likely to be dynamic and very vulnerable. Annual flowering populations of floating water-plantain *Luronium natans* occur as dynamic meta-populations, where individual populations will colonise, expand and set seed in suitable habitat and then decline and disappear due to community succession.

Table 1: Supplementary Advice for Qualifying Features: S1831. *Luronium natans*; Floating water-plantain

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: structure /function	**Habitat structure**	Ensure the supporting open water habitat is sufficiently free of other competing vegetation to allow space for floating water-plantain to thrive.	Floating water-plantain *Luronium natans* is intolerant of competition from other plants and occurs in a range of freshwater habitats – oligotrophic and mesotrophic lakes, slow-flowing rivers and associated floodplain pools and small pools in heathland. There are also large populations in a number of disused or recently restored canals.	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC site monitoring 2007 to 2016. NATURAL ENGLAND. 2014. Rapid Integrated Site Assessment for Cannock Extension Canal Units 1 and 2. Natural England. NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.
	Vegetation structure	Ensure supporting open water habitat is free of shade or competitive vegetation, with taller species associated with floating water-plantain *Luronium natans* patches no more than occasional.	Excessive overhanging vegetation both results in shading of aquatic vegetation and large inputs of organic matter in the form of leaf litter.	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC site monitoring 2007 to 2016. NATURAL ENGLAND. 2014. Rapid Integrated Site Assessment for Cannock Extension Canal Units 1 and 2. Natural England. NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				monitored as part of Natural England's SSSI condition assessments.
	Vegetation composition: invasive non-native species	Ensure the following invasive non-native species are absent from the site or being contained at a level which does not cause loss of area of the floating water-plantain feature; New Zealand pigmyweed *Crassula helmsii,* Floating pennywort *Hydrocotyle ranunculoides,* Parrot feather watermilfoil *Myriophyllum aquaticum,* Water fern *Azolla filiculoides*.	These alien plant species are highly competitive and will impact negatively on floating water-plantain *Luronium natans*, which is not competitive. Other introduced species may have effects on ecosystem functioning through the food web or via direct effects on the plant community, e.g. artificially large waterfowl populations or non-native crayfish species.	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC site monitoring 2007 to 2016. NATURAL ENGLAND. 2014. Rapid Integrated Site Assessment for Cannock Extension Canal Units 1 and 2. Natural England. NATURAL ENGLAND. 2014. Site Improvement Plan: Cannock Extension Canal (SIP036). NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.
Supporting habitat: structure/ function	**Water clarity**	Restore a high degree of water clarity throughout the whole site. Most of the canal bed should be clearly visible in summer.	Water clarity is an indicator of light availability for submerged plants. Elevated turbidity levels will have adverse impacts on submerged plant communities. This may be the result of, for example, suspended solids resulting from disturbance by boats, high phytoplankton densities, the presence of bottom-feeding fish and inputs of silt-laden drainage water after rain can also cause loss of clarity. Although floating water-plantain *Luronium natans* may occur in naturally dystrophic waters with humic staining, this may be exacerbated by acidification, reducing water clarity further.	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC site monitoring 2007 to 2016. NATURAL ENGLAND. 2014. Site Improvement Plan: Cannock Extension Canal (SIP036). NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Reason for restore: 700m of the southern end of unit 1 is very turbid (between the old colliery basins and Wyrley Grove Bridge) due to a build-up over the years of very fine sediments contained in run-off from colliery shale waste on Wyrley Common. Once these very fine, unconsolidated sediments are disturbed it takes longer for the water to clear than if the sediments were coarser. The situation has been improving over the last few years due to mitigation works on Wyrley Common but water clarity and thus aquatic plant cover is still much poorer in this section than in the other parts of the SSSI. On-site conservation measures to address this issue include additional dredging and shade reduction works (from shading trees) along critical sections of the canal.	This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.
Supporting habitat: structure/function	**Water levels**	Maintain open water levels which are sufficient to maintain the abundance of the floating water-plantain *Luronium natans* population	In shallow pools and similar sites plants often flower and fruit on draw-down zones as summer water levels recede. In canals floating water-plantain *Luronium natans* is very rarely exposed in this way so is unable to reproduce sexually therefore canal populations are sterile clones that can only reproduce vegetatively. The Cannock Extension Canal has very little flow of water due to being a cul-de-sac off a long level section of the Wyrley & Essington Canal. There are no locks on either canal. There is only limited inflow from the southern end to offset leakage and evaporation.	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC water level monitoring data. NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments using data from the Canal and River Trust's automatic level reader at Pelsall Junction.
Supporting habitat: structure/function	**Water quality**	Restore water quality throughout the whole site at the following standards to provide the necessary conditions to	For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year during key stages of their life cycle.	NATURAL ENGLAND. 2016. Cannock Extension Canal SAC water quality monitoring data. NATURAL ENGLAND. 2014. Site

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		support the floating water-plantain *Luronium natans* feature; Biochemical Oxygen Demand = level 'B' Dissolved Oxygen = > 70% Total Phosphorous concentrations (annual mean) for mesotrophic canal = <20µg/l	Poor water quality and inadequate quantities of water can adversely affect habitat(s) on which the SAC features depend. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the SAC Conservation Objectives but in some cases more stringent standards may be needed to support the SAC feature. Floating water-plantain *Luronium natans* populations are present across a wide range of habitats with a corresponding range of water chemistry. This suggests that its tolerances to most water chemistry parameters are not especially demanding although links between presence/persistence and water quality are not yet understood. As such the water quality targets set out for freshwater habitats should be sufficient to protect populations from adverse impacts. **Reason for restore** Recent water quality monitoring shows that the water quality objective is currently not being met: March 2015 6 spot samples= all <10ug/l TP, DO not measured, BOD grade B. Aug 2016 3 spot samples = 50-100ug/l TP, average = 70ug/l, no other nutrient measured. 2009: Annual monitoring, from Wyrley Grove Bridge = average TP = 40ug/l (n=36), Annual monitoring is required from a number of sampling locations along the canal to understand the water quality at this site.	Improvement Plan: Cannock Extension Canal (SIP036). NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.
Supporting habitat:	**Substrate sediment**	Restore a habitat substrate that is	Fine, unconsolidated sediments are an unsuitable rooting medium and plants may be subject to uprooting. Conversely,	NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
structure /function		characterised by cohesive sediments which are not too coarse or too fine.	where sediment is too coarse and mineral there may be scouring and poor root anchorage. **Reason for restore:** 700m of the southern end of unit 1 is very turbid (between the old colliery basins and Wyrley Grove Bridge) due to a build-up over the years of very fine sediments contained in run-off from colliery shale waste on Wyrley Common. Once these very fine, unconsolidated sediments are disturbed it takes longer for the water to clear than if the sediments were coarser. The situation has been improving over the last few years due to mitigation works on Wyrley Common but the very fine sediments in this area make this section much poorer than in other parts of the SSSI. On-site conservation measures to address this issue include additional dredging and shade reduction works (from shading trees) along critical sections of the canal.	Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.
Supporting processes (on which the feature and/or its supporting habitat relies)	**Disturbance of habitat by human activity**	Ensure the duration, intensity and/or the frequency of disturbance events remain at levels that are necessary to support the feature.	Floating water-plantain *Luronium natans* is sensitive to competition for light and nutrients from other plant species. The loss or reduction in the disturbance regime that would normally arrest succession is particularly significant. In canals the disturbance regime is related to dredging (removal of sediments) and boat traffic. Species-richness of the canal as a whole depends not only on water quality but also on the intensity of boat traffic and channel management. In the absence of management unused and derelict canals become overgrown with emergent vegetation and lose the open water element of their flora. Heavily used canals lose much of their submerged and floating-leaved vegetation because the water column becomes turbid and plants are chewed up by propellers and uprooted by the passage of boats. Dredging is an important management tool to increase the distance between boats and the bottom of the canal bed/silt.	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC boat counter monitoring data. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments using data from the Canal and River Trust's boat counter on the canal.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Boat movement and dredging are key management tools for this site, both by stopping succession of more dominant plants and by occasional disturbance events to the canal banks that can create colonisation opportunities for the features of interest. Annual boat traffic movements are currently to be confirmed for the Cannock Extension Canal. The Canal and River Trust dredge the Cannock Extension Canal as part of their national dredging programme with additional dredging works, as identified by recent survey, being undertaken as one of the conservation measures for the site.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Regeneration potential (vegetative)**	Maintain sufficient areas of shallow and still water for the development of ascending stolons bearing chains of plantlets, and for the production of floating leaves.	Canal populations are sterile clones that only reproduce vegetatively. Perennial populations of floating water-plantain *Luronium natans* should exhibit a range of different plant sizes	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SAC site monitoring 2007 to 2016. NATURAL ENGLAND. 2014. Rapid Integrated Site Assessment for Cannock Extension Canal Units 1 and 2. Natural England. NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.
Population (of the feature)	**Population abundance**	Restore the abundance of the floating water-plantain *Luronium natans*, with individual plants always occurring frequently throughout	This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-	CANAL AND RIVER TRUST. 2016. Cannock Extension Canal SSSI site monitoring 2007 to 2016. NATURAL ENGLAND. 2014. Rapid Integrated Site Assessment for Cannock

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		the SAC, and avoid deterioration from its current level as indicated by the latest mean peak count or equivalent.	value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period. The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature. Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account in any assessment. Unless otherwise stated, the population size or presence will be that measured using standard methods, such as peak mean counts or breeding surveys. This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise that the figures stated are the best available. In 1993 when the canal was notified as a SSSI floating water-plantain *Luronium natans* was abundant throughout much of the canal apart from the northern section from the old colliery basins to the A5 where it was less extensive. Assessment in 2017 found that floating water-plantain *Luronium natans* is	Extension Canal Units 1 and 2. Natural England. NATURAL ENGLAND. 2012. Cannock Extension Canal SSSI Definitions of Favourable Condition. Available from Natural England. UNIVERSITY OF HERFORDSHIRE. 1999. Survey of key sites within West Midland Meres and Mosses Natural Area for *Luronium natans*. Report to English Nature. ENGLISH NATURE. 1993. SSSI Notification documents. NATURE CONSERVANCY COUNCIL. 1989. Site survey. This attribute will be regularly monitored through the Canal and River Trust's annual site survey and periodically monitored as part of Natural England's SSSI condition assessments.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			present throughout much of the site, from Pelsall Junction to the A5, abundant over circa 50% of the canal where it forms extensive carpets over the bed. Over a further circa 15% of the canal it is present but less dominant, and through the central section of the canal it is slowly recolonizing.	
Supporting processes (on which the feature and/or its supporting habitat relies)	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	Active and ongoing conservation management is needed to restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, site management strategies or plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	ENGLISH NATURE, 2005. Views about the management of Cannock Extension Canal SSSI. NATURAL ENGLAND. 2014. Site Improvement Plan: Cannock Extension Canal (SIP036).
Supporting processes (on which the feature and/or its supporting habitat relies)	**Adaptation and resilience**	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site	This recognises the increasing likelihood of supporting habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as being high,	NATURAL ENGLAND (2015). Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs at http://publications.naturalengland.org.uk/publication/4954594591375360)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			taking into account the sensitivity, fragmentation, topography and management of its habitats/supporting habitats. This means that this site is considered to be among the most vulnerable sites overall and are likely to require the most adaptation action, most urgently, such as reducing habitat fragmentation, creating more habitat to buffer the site or expand the habitat into more varied landscapes and addressing particular management and condition issues. Individual species may be more or less vulnerable than their habitat itself.	
Supporting processes (on which the feature relies)	**Air quality**	Restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for these features of the site on the Air Pollution Information System (www.apis.ac.uk).	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. The critical load for nitrogen is currently being exceeded at this site.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk). NATURAL ENGLAND. 2014. Site Improvement Plan: Cannock Extension Canal (SIP036).

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Version Control Advice last updated: N/A			
Variations from national feature-framework of integrity-guidance: • Attribute relating to 'recruitment of plants' has been deleted as the population in the Cannock Extension Canal SAC reproduces vegetatively. • The text in the Supporting and Explanatory Notes for the following sections have been amended and added to: Water clarity, Water level, Water quality, Disturbance and Adaption and Resilience.			

APPENDIX 6

Site Improvement Plan for Cannock Extension Canal SAC

Improvement Programme for England's Natura 2000 Sites (IPENS)

Planning for the Future

Site Improvement Plan

Cannock Extension Canal

Site Improvement Plans (SIPs) have been developed for each Natura 2000 site in England as part of the Improvement Programme for England's Natura 2000 sites (IPENS). Natura 2000 sites is the combined term for sites designated as Special Areas of Conservation (SAC) and Special Protected Areas (SPA). This work has been financially supported by LIFE, a financial instrument of the European Community.

The plan provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site(s) and outlines the priority measures required to improve the condition of the features. It does not cover issues where remedial actions are already in place or ongoing management activities which are required for maintenance.

The SIP consists of three parts: a Summary table, which sets out the priority Issues and Measures; a detailed Actions table, which sets out who needs to do what, when and how much it is estimated to cost; and a set of tables containing contextual information and links.

Once this current programme ends, it is anticipated that Natural England and others, working with landowners and managers, will all play a role in delivering the priority measures to improve the condition of the features on these sites.

The SIPs are based on Natural England's current evidence and knowledge. The SIPs are not legal documents, they are live documents that will be updated to reflect changes in our evidence/knowledge and as actions get underway. The information in the SIPs will be used to update England's contribution to the UK's Prioritised Action Framework (PAF).

The SIPs are not formal consultation documents, but if you have any comments about the SIP or would like more information please email us at IPENSLIFEProject@naturalengland.org.uk, or contact Natural England's Responsible Officer for the site via our enquiry service 0300 060 3900, or enquiries@naturalengland.org.uk

This Site Improvement Plan covers the following Natura 2000 site(s)

UK0012672 Cannock Extension Canal SAC

Site description

Cannock Extension Canal SAC supports the largest known population of Floating Water-plantain *Luronium natans* in Staffordshire. Floating water-plantain is a rare, small white-flowered water plant only found in Europe. In the UK it is considered a nationally scarce plant. It is found in Wales, and central England, growing in lakes, reservoirs, ponds, slow-flowing rivers and canals.

Floating water-plantain occurs as two forms: in shallow water with floating oval leaves; in deep water with submerged rosettes of narrow leaves. The assemblage of 34 aquatic plant species places this site in the top 20% of British canals. The site also has a good dragonfly assemblage.

Plan Summary

This table shows the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. The list of delivery bodies will include those who have agreed to the actions as well as those where discussions over their role in delivering the actions is on-going.

Priority & Issue	Pressure or Threat	Feature(s) affected	Measure	Delivery Bodies
1 Water Pollution	Pressure	S1831 Floating water-plantain	Assess and reduce sediment inputs and diffuse pollution	Canal and River Trust, Environment Agency, Natural England, Landowner(s)
2 Overgrazing	Pressure	S1831 Floating water-plantain	Assess the effects of Canada geese	Canal and River Trust, Natural England
3 Invasive species	Pressure/ Threat	S1831 Floating water-plantain	Monitor and control invasive non-native species.	Canal and River Trust, Natural England
4 Air Pollution: risk of atmospheric nitrogen deposition	Pressure	S1831 Floating water-plantain	Develop a Site Nitrogen Action Plan	Not yet determined

Issues and Actions

This table outlines the prioritised issues that are currently impacting or threatening the condition of the features, and the outstanding actions required to address them. It also shows, where possible, the estimated cost of the action and the delivery bodies whose involvement will be required to implement the action. Lead delivery bodies will be responsible for coordinating the implementation of the action, but not necessarily funding it. Delivery partners will need to support the lead delivery body in implementing the action. In the process of developing the SIPs Natural England has approached the delivery bodies to seek agreement on the actions and their roles in delivering them, although in some cases these discussions have not yet been concluded. Other interested parties, including landowners and managers, will be involved as the detailed actions are agreed and delivered. Funding options are indicated as potential (but not necessarily agreed or secured) sources to fund the actions.

1 Water Pollution

Historic sediment loads into the canal have occurred, the origin of which has now been resolved. However this may need to be revisited to protect the site in the future as heavy rainfall events cause stained inflows into the site indicating that there is still a sediment load, albeit low, in the inflow water. In addition all other inflows into the canal need to be assessed to ensure that only clean water is entering the canal.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1A	Investigate known inflow to make sure that previous works to control sediments are still having the desired effect. If these are not working properly, they need to be rectified to address the problem.	Not yet determined	2014-2015	Partnership agreement	Not yet determined	Natural England	Canal and River Trust, Environment Agency, Landowner(s)

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1B	There is a need to understand the flow of water from all land surrounding the site, including any road drainage.Undertake a catchment walkover to assess all inflows, including any discharges from boats, moorings and roads. Devise solutions if any problems are found.	Not yet determined	2014-18	Partnership agreement	Not yet determined	Natural England	Environment Agency, Local Authorities, Landowner(s)

2 Overgrazing

Large groups of Canada geese are grazing on the waterplants in the canal. There is a risk that this could affect the vegetation community including Floating water-plantain as well as contributing additional nutrients via excreta.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2A	The effects of grazing on aquatic macrophytes by large groups of Canada geese needs to be assessed and resolved.	Not yet determined	2014-18	Investigation / Research / Monitoring	Conservation Enhancement Scheme (CES)	Canal and River Trust	Natural England

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2B	Raise awareness of the importance of the site with the local community if the feeding of geese (e.g. with bread) is an issue.	Not yet determined	2014-20	Advice: Education & awareness raising	Not yet determined	Canal and River Trust	Natural England

3 Invasive species

Water fern *Azolla filiculoides* and Water pennywort *Hydrocotyle ranunculoides* have been present on the canal in the recent past and have been successfully controlled by the Canal and Rivers Trust. Any invasive species that get into the canal need to be eradicated to prevent damage to the interest features and associated biodiversity of the site.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
3A	Continue to monitor regularly and control as necessary all invasive non-native species.	Not yet determined	2014-20	Invasive Control Plan: Other	Not yet determined	Canal and River Trust	Natural England

4 Air Pollution: risk of atmospheric nitrogen deposition

Nitrogen deposition exceeds site relevant critical load. The site could be affected by major roads, industrial estates and farming in the vicinity.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4A	Control, reduce and ameliorate atmospheric nitrogen impacts.	Not yet determined	2014-20	Site Nitrogen Action Plan	Not yet determined	Not yet determined	Not yet determined

Site details

The tables in this section contain site-relevant contextual information and links

Qualifying features

#UK Special responsibility

Cannock Extension Canal SAC	S1831 *Luronium natans*: Floating water-plantain

Site location and links

Cannock Extension Canal SAC

Area (ha) **5.47**	*Grid reference*	**SK020058**	Map link
Local Authorities			Staffordshire; Walsall
Site Conservation Objectives			European Site Conservation Objectives for Cannock Extension Canal SAC
European Marine Site conservation advice			n/a
Regulation 33/35 Package			n/a
Marine Management Organisation site plan			n/a

Water Framework Directive (WFD)

The Water Framework Directive (WFD) provides the main framework for managing the water environment throughout Europe. Under the WFD a management plan must be developed for each river basin district. The River Basin Management Plans (RMBP) include a summary of the measures needed for water dependent Natura 2000 sites to meet their conservation objectives. For the second round of RBMPs, SIPs are being used to capture the priorities and new measures required for water dependent habitats on Natura 2000 sites. SIP actions for non-water dependent sites/habitats do not form part of the RBMPs and associated consultation.

Cannock Extension Canal SAC

River basin	Humber	Humber RBMP
WFD Management catchment	Staffordshire Trent Valley	
WFD Waterbody ID (Cycle 2 draft)	n/a	

Overlapping or adjacent protected sites

Site(s) of Special Scientific Interest (SSSI)	
Cannock Extension Canal SAC	Cannock Extension Canal SSSI

National Nature Reserve (NNR)	
Cannock Extension Canal SAC	n/a

Ramsar	
Cannock Extension Canal SAC	n/a

Special Areas of Conservation (SAC) and Special Protection Areas (SPA)	
Cannock Extension Canal SAC	n/a

Version	*Date*	*Comment*
0.3	07/10/2014	

APPENDIX 7

Cannock Chase SAC Citation and Natura 2000
Standard Data Form

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Cannock Chase

Unitary Authority/County: Staffordshire

SAC status: Designated on 1 April 2005

Grid reference: SJ982188

SAC EU code: UK0030107

Area (ha): 1236.93

Component SSSI: Cannock Chase SSSI

Site description:
The area of lowland heathland at Cannock Chase is the most extensive in the Midlands. The character of the vegetation is intermediate between the upland or northern heaths of England and Wales and those of southern counties. Dry heathland communities are of the heather – western gorse (*Calluna vulgaris – Ulex gallii*) and heather – wavy hair-grass (*Calluna vulgaris – Deschampsia flexuosa)* types. Within the heathland, species of northern latitudes occur, such as cowberry *Vaccinium vitis-idaea* and crowberry *Empetrum nigrum*. Cannock Chase has the main British population of the hybrid bilberry *Vaccinium intermedium*, a plant of restricted occurrence. The scarcity of water over much of the Chase effectively confines wetland flora and fauna to the stream valley systems and a scatter of natural and artificial pools and damp depressions. The Oldacre and Sherbrook valleys have small-scale mosaics of spring-fed mire and wet heath vegetation, a result of complex water chemistry. Where acidic conditions prevail the mires are mostly formed of bog mosses *Sphagnum* spp. with cranberry *Vaccinium oxycoccus*, cottongrasses *Eriophorum* spp. and cross-leaved heath *Erica tetralix*.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- European dry heaths
- Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath)

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0030107
Date of registration: 14 June 2005

Signed: Trevor Salmon

On behalf of the Secretary of State for Environment, Food and Rural Affairs

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	**UK0030107**
SITENAME	**Cannock Chase**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0030107

1.3 Site name

Cannock Chase

1.4 First Compilation date	1.5 Update date
2001-03	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:	2001-03
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
-2.026666667	52.76638889

2.2 Area [ha]:

1244.2

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
UKG2	Shropshire and Staffordshire

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
4010			16.17		G	C	C	B	C
4030			933.15		G	B	C	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)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site					Site assessment	
		Scientific									

G	Code	Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo
I	1092	Austropotamobius pallipes			p				P	DD	D			
A	1166	Triturus cristatus			p	11	50	i		M	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **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); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N08	76.3
N17	12.0
N21	10.5
N06	0.5
N23	0.7
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: nutrient-poor,acidic,peat,sandstone 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Northern Atlantic wet heaths with Erica tetralix for which the area is considered to support a significant presence. European dry heaths 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	A04		I
H	K04		I
H	J02		B
H	H04		B

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

APPENDIX 8

Cannock Chase SSSI

COUNTY: STAFFORDSHIRE SITE NAME: CANNOCK CHASE

DISTRICT: Stafford/Cannock Chase SITE REF: 15WDD

Status: Site of Special Scientific Interest (SSSI) notified (Under Section 28 of the Wildlife and Countryside Act) 1981 as amended

Local Planning Authority: STAFFORDSHIRE COUNTY COUNCIL, Stafford Borough Council/Cannock Chase District Council

National Grid Reference: SJ 990180 Area: 1264.3 (ha.) 3124.0 (ac.)

Ordnance Survey Sheet 1:50,000: 127 1:10,000: SJ 91 NE, SK 01 SW, SE 92 SW, SK 02 SW, SK 01 NW

Date Notified (Under 1949 Act): 1951 Date of Last Revision: 1968

Date Notified (Under 1981 Act): 1987 Date of Last Revision: –

Other Information:
1 Part of the site is managed as a Local Nature Reserve.
2 A part of the site lies within Cannock Chase County Park.
3 The site is listed in 'A Nature Conservation Review' edited by D A Ratcliffe (Cambridge University Press 1977).
4 Site boundary alteration (extension & reduction).
5 Site includes former SSSI's known as 'Penkridge Bank' and 'Upper Stafford Brook'.
6 Site lies within Cannock Chase Area of Outstanding Natural Beauty.

Description and Reasons for Notification:
A large, diverse area of seminatural vegetation comprising the most ecologically valuable parts of the former Royal Chase, one of a nationally important series of relict ancient Forest/Chase landscapes in the Midlands. Acidic soils derived from Triassic sandstone and marls support a range of woodland and scrub types of varied origin. The area of lowland heathland is the most extensive in the Midlands. Its special interest also reflects an unusual floristic character, intermediate between heathlands of northern and upland England and Wales and those of southern counties. The valley mire/wet heath communities are rare, threatened vegetation types, being some of the most floristically-rich and representative examples of their type in central England. The outstandingly diverse invertebrate fauna includes many species of restricted national occurrence.

The woodlands of Cannock Chase are predominantly dry oak-birch woodlands, though four main types are recognised. The mature sessile oak *Quercus petraea* – silver birch *Betula pendula* stand at Brocton Coppice is an eastern outlier of a mainly western formation. The beetle fauna here is of special interest for the presence of a group of species indicative of ancient woodland sites with a continuity of old timber trees. As those conditions are rare, so are their dependent species and Brocton is a refuge for some beetles at the northern limits of their British range. Colonisation of heathland by silver birch over many years has resulted in closed birch canopies of differing ages on much of Penkridge Bank and in the Brocton area. These stands are noteworthy for their floristic impoverishment. Bracken *Pteridium aquilinum*, bilberry *Vaccinium myrtillus* or wavy hair-grass *Deschampsia flexuosa* are the main ground flora constituents, and rowan *Sorbus aucuparia* is often an associated tree. Young birch, locally with scots pine *Pinus sylvestris*, is invading open ground in any parts of the site and a rapid progression towards woodland is evident where tree density is greatest. In damper situations alder *Alnus glutinosa* becomes locally abundant. The alder carr of the lower Sherbrook valley and the stream bottoms draining Penkridge Bank is thought to form the largest area of this woodland type

in Staffordshire. Scrub of grey willow *Salix cinerea* also occurs in the valley systems, achieving greatest cover in the Oldacre valley.

The loss and fragmentation of heathland since 1800 has drastically reduced its extent throughout Europe. In lowland England this has been by at least 75%, never-the-less the heaths that remain are amongst the most extensive and intact in Europe. Those of Cannock Chase, whilst occupying a small portion of their original area, are collectively the largest remnant of this habitat in the Midlands. Three elements distinguish Cannock from most other lowland heaths in Britain. Firstly the geographical location and altitude is responsible for a grouping of heathland plants of varied distribution patterns. Thus heather *Calluna vulgaris*, bell heather *Erica cinerea* and cross-leaved heath *E. tetralix* are species of west European oceanic distribution. Mixed with these are plants found most abundantly in continental northern latitudes eg bilberry and others typically associated with arctic and alpine regions eg cowberry *Vaccinium vitis-idaea* and crowberry *Empetrum nigrum*. Secondly, Cannock is the main British station for the hybrid bilberry *Vaccinum intermedium*, a plant of restricted occurrence in central-northern England. Thirdly, the distinct scarcity of lichens and mosses is in sharp contrast with the nearest submontane heathlands, those of the South Pennines and Welsh Borders. In a few moister situations, such as south of Ansons Bank, the vegetation is dominated by purple moor-grass *Molinia caerulea* with cottongrasses *Eriophorum* spp. Elsewhere, on dry, burnt or disturbed ground wavy hair-grass and bracken dominate, the latter especially on steeper slopes. Scrub of gorse *Ulex* spp. and hawthorn *Crataegus monogyna* provides further habitat variety in areas subject to past disturbance.

The scarcity of water over much of the Chase effectively confines wetland flora and fauna to the stream valley systems and a scatter of natural and artificial pools and damp depressions. The Oldacre and Sherbrook valleys have small-scale mosaics of spring-fed mire and wet heath vegetation, a result of complex water chemistry. Where acidic conditions prevail the mires are mostly formed of bog mosses *Sphagnum* spp. with cranberry *Vaccinium oxycoccus*, cottongrasses and cross-leaved heath. They have close counterparts in the valley mires of the New Forest and form a geographical and ecological link between the latter southern types and their northern equivalents. This community contains several plants rare in the county and or nationally uncommon eg marsh fern *Thelypteris thelypteroides*, round-leaved sundew *Drosera rotundifolia*, few-flowered spike-rush *Eleocharis quinqueflora* and bog asphodel *Narthecium ossifragum*. Locally, nutrient enriched springwater gives rise to flushed ground rich in sedges and flowering plants including such uncommon species as dioecious sedge *Carex dioica*, long-stalked yellow-sedge *C. lepidocarpa*, common butterwort *Pinguicula vulgaris* and grass of Parnassus *Parnassia palustris*. In lowland situations these mire communities are now extremely uncommon in the Midlands. Tall sedge 'fen' occupies much of the Sherbrook valley with abundant greater tussock-sedge *Carex paniculata* and narrow buckler-fern *Dryopteris carthusiana*. These two species also occur in association with alder carr. The pool in Milford Quarry is locally important for amphibians and, as with standing waters elsewhere on the Chase, also for dragonflies and damselflies.

Of the invertebrate fauna the moths and beetles have special prominence. The former include many notable woodland species such as the angle-striped sallow *Enargia paleacea*, argent and sable *Rheumaptera hastata*, and alder kitten *Furcula bicuspis*. The heathland and mires support a further range of Lepidoptera including the small pearl-bordered fritillary *Boloria selene*, the anomalous *Stilbia anomala* and the grass wave *Perconia strigillaria*. Of the numerous beetles, *Pediacus dermestoides* and *Biplophorus minutus* are two of the rarer old timber specialists and *Gnypeta velata* an uncommon wetland species with southern affinities. Amongst the other insect groups, bog bush-cricket *Metrioptera brachyptera* occurs here at its only county locality.

The large size and mixed vegetation of Cannock Chase supports a major breeding concentration of fallow deer *Dama dama*, which probably contains the genetic residue of the late Mediaeval herds. The Chase as a whole has a nationally significant population of

nightjar *Caprimulgus europaeus* and most territories are located within the Site of Special Scientific Interest. The red squirrel *Sciurus vulgaris* occurs in Scots pine woodland around Brindley Heath which is otherwise absent from central southern England. Other animals of note include five species of bat, adder *Vipera berus* and common lizard *Lacerta vulgaris*.a

APPENDIX 9

European Site Conservation Objectives for Cannock Chase SAC

European Site Conservation Objectives for Cannock Chase Special Area of Conservation Site Code: UK0030107

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

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

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

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath

H4030. European dry heaths

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 as amended from time to time (the "Habitats Regulations"). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment', including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where available) will also provide a framework to inform the measures needed to conserve or restore the European Site and the prevention of deterioration or significant disturbance of its qualifying features.

These Conservation Objectives are set for each habitat or species of a Special Area of Conservation (SAC). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving Favourable Conservation Status for that species or habitat type at a UK level. The term 'favourable conservation status' is defined in regulation 3 of the Habitats Regulations.

Publication date: 27 November 2018 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

APPENDIX 10

Cannock Chase SAC Conservation Objectives
Supplementary Advice

European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

Cannock Chase Special Area of Conservation (SAC)
Site code: UK0030107

Photograph: Natural England.

Date of Publication: 8 April 2020

About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Cannock Chase SAC. This advice should therefore be read together with the SAC Conservation Objectives available **here.**

This advice replaces a previous version (dated 8 December 2017) following updates to explanatory notes by Natural England.

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site.

You may also find it helpful to refer to Natural England's SSSI Impact Risk Zone dataset available here.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Cannock Chase Special Area of Conservation (SAC)
Location	Staffordshire (SJ982188)
Site Maps	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	01 April 2005
Qualifying Features	European dry heaths Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath)
Designation Area	1236.93 ha
Designation Changes	None
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Cannock Chase SSSI
Relationship with other European or International Site designations	None
Other information	Natura 2000 Standard Data Form for Cannock Chase SAC

Site background and geography

Cannock Chase is a large, diverse area of semi-natural vegetation comprising the majority of the most ecologically valuable parts of the former Royal Chase, one of a nationally important series of relict ancient Forest/Chase landscapes in the Midlands.

Cannock Chase falls within the Cannock Chase and Cank Wood National Character Area (NCA) and is situated on a high sandstone plateau with deeply incised valleys created during the last glaciation, some of which still have flowing water, some of which are now dry. Acidic soils derived from Triassic sandstone and marls support a range of heathland, valley mire, ancient woodland and scrub types of varied origin. This geology, which can be locally dramatic, and the extent of the varied semi-natural habitats are mainly found within the Special Area of Conservation and form the heart of the Cannock Chase Area of Outstanding Natural Beauty (AONB).

The area of lowland dry heathland at Cannock Chase is the most extensive in the Midlands. Its special interest also reflects an unusual floristic character, intermediate between heathlands of northern and upland England and Wales and those of southern counties. The hot, dry soil conditions found in bare ground in early successional habitats across the dry heathland is important for invertebrates such as mining bees, ants and wasps.

The valley mire/wet heath communities are rare, threatened vegetation types, being some of the most floristically-rich and representative examples of their type in central England. The outstandingly diverse invertebrate fauna includes many species of restricted national occurrence.

Cannock Chase is home to several characteristic heathland birds, including rare and vulnerable ground-nesting species such as nightjar and woodlark that nest and forage on the heathland as well as in clear-fell areas of the nearby commercial forestry plantations. Across the Cannock Chase AONB the populations of these characteristic heathland birds, which also includes Dartford warbler, are of national importance. Cannock Chase is also a regional refuge for declining and vulnerable reptile species such as adder, common lizard, and slow worm. For adder especially, the extent of open habitat across the Cannock Chase plateau makes it an important regional stronghold and ultimately refuge for this highly vulnerable and sensitive animal, for which much of the wider, surrounding countryside is now unavailable.

About the qualifying features of the SAC

The following section gives you additional, site-specific information about this SAC's qualifying features. These are the natural habitats and/or species for which this SAC has been designated.

Qualifying habitats:

- **H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath**

Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils with impeded drainage. The vegetation is typically dominated by mixtures of cross-leaved heath *Erica tetralix*, heather *Calluna vulgaris*, grasses, sedges and *Sphagnum* bog-mosses.

The scarcity of water over much of the Chase effectively confines wetland flora and fauna to the stream valley systems and a scatter of natural and artificial pools and damp depressions. The Oldacre and Sherbrook valleys have small-scale mosaics of spring-fed mire and wet heath vegetation, a result of complex water chemistry. Where acidic conditions prevail the mires are mostly formed of bog mosses *Sphagnum* spp. with cranberry *Vaccinium oxycoccus*, cotton-grasses *Eriophorum* spp. and cross-leaved heath *Erica tetralix*.

The wet heath vegetation at the SAC corresponds mainly to the NVC community type M16 *Erica tetralix – Sphagnum compactum* wet heath, which is present in mosaics in the Sher Brook Valley with a variety of other vegetation communities (vegetation with affinities to M6 *Carex echinata-Sphagnum fallax* mire, M15 *Scirpus cespitosa – Erica tetralix* mire, M21 *Narthecium ossifragum-Sphagnum papillosum* mire and M25 *Molinia caerulea-Potentilla erecta* mire. Also present is vegetation with affinities to M22 *Juncus subnodulosus-Cirsium palustre* and M24 *Molinia caerulea – Cirsium dissectum* fen meadow communities, M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture and S3 *Carex paniculata* swamp).

In the Oldacre Valley the wet heath mosaic vegetation has affinities to M25 *Molinia caerulea-Potentilla erecta* mire and M6 *Carex echinata-Sphagnum fallax* mire. Also present is vegetation with affinities to M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture, and S3 *Carex paniculata* swamp. Also in Oldacre Valley is an area of M10 *Carex dioica-Pinguicula vulgaris* mire and an area of M22 *Juncus subnodulosus-Cirsium palustre* fen meadow.

At Womere there is an area of M4 *Carex rostrata-Sphagnum fallax* mire.

- **H4030. European dry heaths**

European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex* spp., bilberry *Vaccinium* spp. or bell

heather *Erica cinerea*, though other dwarf-shrubs are important locally. Nearly all dry heath habitat is semi-natural, being derived from woodland through a long history of grazing and burning.

The area of lowland heathland at Cannock Chase is the most extensive in the English Midlands, although there have been losses due to fragmentation and scrub/woodland encroachment. The character of the vegetation is intermediate between the upland or northern heaths of England and Wales and those of southern counties.

Dry heathland communities belong to NVC types H8 *Calluna vulgaris–Ulex gallii* and H9 *Calluna vulgaris–Deschampsia flexuosa* heaths. Within the heathland, species of northern latitudes occur, such as cowberry *Vaccinium vitis-idaea* and crowberry *Empetrum nigrum*. Cannock Chase has the main British population of the hybrid bilberry *Vaccinium intermedium*, a plant of restricted occurrence.

Qualifying Species:

- None

References

RODWELL, J.S. (ed.) 1991. *British Plant Communities. Volume 1. Woodlands and scrub*. Cambridge University Press.
RODWELL, J.S. (ed.) 1991. *British Plant Communities. Volume 2. Mires and heath*. Cambridge University Press.

Table 1: Supplementary Advice for Qualifying Features: H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Extent of the feature within the site**	Maintain the total extent of the H4010 wet heath feature (as a mosaic of vegetation with affinities to M6, M15, M16, M21 and M25, along with S3 and M23 vegetation) at no less than 22ha, including 1ha of M22 & M24 and smaller areas, <0.01ha, of M10 and M4. Maintain valley bogs/fen containing a mosaic of M6 *Carex echinata-Sphagnum fallax* mire, M15 *Scirpus cespitosa – Erica tetralix* mire, M16 – *Erica tetralix & Sphagnum compactum* wet heath, M21 *Narthecium ossifragum-Sphagnum papillosum* mire and M25 *Molinia caerulea-Potentilla erecta* mire, along with with M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture and S3 *Carex paniculata* swamp. Also present is vegetation with affinities to M22 *Juncus subnodulosus-Cirsium palustre* and M24 *Molinia caerulea – Cirsium dissectum* fen meadow communities, and M10 *Carex dioica-Pinguicula vulgaris* mire. M4 *Carex rostrata-Sphagnum fallax* mire is also present within the European Dry Heaths feature.	There should be no measurable reduction in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis. The actual area of wet heath cannot be calculated separately from the other vegetation communities forming the valley bogs/fen mosaic.	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. CANNOCK CHASE SAC PARTNERSHIP. 2016. NATURAL ENGLAND. 2014. WHITE, J., MCGIBBON, R. & UNDERHILL-DAY, J. 2012. LILEY, D., UNDERHILL-DAY, J., WHITE, J. & SHARP, J. 2009. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006. This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				England's SSSI condition assessments.
Extent and distribution of the feature	**Spatial distribution of the feature within the site**	Maintain the distribution and configuration of the H4010 wet heath feature mosaic, including where applicable its component vegetation types, across the site.	A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. Such conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	Please see above under "Extent".
Structure and function (including its typical species)	**Vegetation community transitions**	Maintain the extent of areas of transition between the H4010 wet heath feature mosaic and communities which form other heathland-associated habitats (such as dry and humid heaths, mires, acid grasslands, scrub and woodland).	Transitions and zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NATURAL ENGLAND. 2014. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006. This attribute will be

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation community composition**	Ensure the component vegetation communities of the H4010 wet heath feature mosaic are broadly referable to and characterised by the following National Vegetation Classification types: **In the Oldacre Valley:** wet heath mosaic vegetation with affinities to M25 *Molinia caerulea-Potentilla erecta* mire and M6 *Carex echinata-Sphagnum fallax* mire. **In the Sher Brook Valley:** M16 *Erica tetralix – Sphagnum compactum* wet heath, present in mosaics with a variety of other vegetation communities (vegetation with affinities to M6 *Carex echinata-Sphagnum fallax* mire, M15 *Scirpus cespitosa – Erica tetralix* mire, M21 *Narthecium ossifragum-Sphagnum papillosum* mire and M25 *Molinia caerulea-Potentilla erecta* mire.	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species, and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NATURAL ENGLAND. 2014. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation structure: cover of dwarf shrubs**	Restore an overall cover of dwarf shrub species across the H4010 wet heath feature to within 25-30%. Dwarf-shrubs include: *Calluna vulgaris, Empetrum nigrum,Erica cinerea, E.*	Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) are needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		tetralix, Ulex gallii, Vaccinium myrtillus, V. vitis-idaea (and hybrids).	vegetation types during different stages of their life cycle. The structural character of the heathland feature is strongly influenced by the growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families). The ericaceous species heather or ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *Erica tetralix*, Dorset heath *Erica ciliaris*, Cornish heath *Erica vagans*, bilberry or blaeberry *Vaccinium myrtillus* and cowberry *Vaccinium vitis-idaea* are the commonest and most characteristic dwarf-shrubs. Hybrids of Dorset and crossleaved heath and of bilberry and cowberry can be locally abundant. *Calluna* is usually the most abundant. Crowberry *Empetrum nigrum*, another common species in some coastal and transitional heaths, is not strictly ericaceous but is often treated as an ericoid species. **Reason for restore:** this is due to the currently low cover (5-10%) of dwarf shrubs present across the feature as recorded in the latest condition assessments. At Oldacre valley this is considered to be due to a combination of the long-term effects of: • Damaged hydrology throughout the wetland area due to the presence of the functioning WW1 drainage system • Eutrophication from the WW1 drainage system • Lack of conservation grazing management contributing to a dominance of *Molinia caerulea* that has resulted in poor structural and species diversity At Sher Brook valley, this is due to a combination of the long-term effects of: • Drying out of the hydrological unit • Lack of conservation grazing management contributing to a dominance of *Molinia caerulea* that has resulted in poor structural and species diversity • Localized eutrophication. In 2016 further work was done to understand the extent of the drying out in the Sher Brook valley and this investigation revealed former groundwater outflows that are now dry, and peat in situations too dry to currently lead to the formation of peat. Such features indicate that there has been a general reduction in elevation of groundwater outflows along the valley, in the order of between 1 and 3 m. The timescale of such changes is not certain, but the state of decay of some tussock sedge remnants is suggestive of several decades at least.	NATURAL ENGLAND. 2014; 2013; 2010. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	**Vegetation structure: heather age structure**	Restore a diverse age structure amongst the ericaceous shrubs typically found across the H4010 wet heath feature. No one growth form should be dominant.	Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather comprising different phases of growth, with all stages of growth present across the wet heath feature. **Reason for restore:** this is due to a lack of a diverse age structure amongst the ericaceous shrubs as most is mature with hardly any pioneer or young heather. This even-aged structure is due to the effects of insufficient removal of biomass either by conservation grazing or cutting, contributing to dominance by purple moor-grass *Molinea caerulea*. Underpinning this is the effects of the damaged hydrology. Measures to restore as near-natural as possible hydrological functioning of the wetland, along with appropriate long-term grazing management, will encourage the regeneration of typical ericaceous shrubs at the expense of the dominant *Molinia caerulea* and help restore the feature over time.	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NATURAL ENGLAND. 2014; 2013; 2010. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Vegetation structure: cover of gorse	Maintain the cover of common gorse *Ulex europaeus* across the whole of H4010 wet heath feature at a typically low level of <10%.	Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining bird species, and excellent winter roosting. The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators. However gorse may cause problems if unchecked by dominating an area, eliminating other typical heathland species. Extensive mature stands may also be serious fire hazards.	NATURAL ENGLAND. 2014; 2013; 2010. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	Vegetation structure: tree cover	Restore the open character of the H4010 wet heath feature, with a typically scattered (not overly clumped in one area) and low cover of trees and scrub of between 1-10%	Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are usually very important in providing warmth, shelter, cover, food plants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this habitat feature should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. If scrub is locally important for any associated species with their own specific conservation objectives, then a higher level of cover will be acceptable. The area of scrub/tree cover should be stable or not increasing as a whole. **Reason for restore:** the latest assessment in July 2013 for Unit 25 Oldacre valley mire found that the feature failed this target due to an average cover of 15% trees and scrub in the assessed stops. Tree and scrub cover across the wetland mosaic in the Oldacre valley is currently estimated (from 2016 aerial photography and site visits) at 30%. The latest assessment in Aug 2010 for Unit 26 Sher Brook valley found that the feature failed this target due to a cover of trees and scrub of 10-15% locally at the southern end of the unit where the best mire remains. Tree and scrub cover across the wetland mosaic in the Sher Brook valley is currently estimated (from 2016 aerial photography and site visits) at 20%.	NATURAL ENGLAND. 2014; 2013; 2010. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation composition: bracken cover**	Restore the cover of dense bracken across the H4010 wet heath feature to a typically low level of <5%.	The spread of bracken *Pteridium aquilinum* is a problem on many lowland heathlands. The unpalatable nature and density of bracken as a tall-herb fern, and its decomposing litter, can smother and shade out smaller and more characteristic heathland vegetation. Usually active management of bracken is required to reduce or contain its cover across this habitat feature. But this fern has also some nature conservation value, for example on sites where fritillary butterflies occur and utilise bracken litter habitat. **Reason for restore:** the latest assessment in July 2013 for Unit 25 Oldacre valley mire found that bracken cover was on average 10% in the assessed stops. Dense bracken cover across the wetland mosaic in the Oldacre valley is currently estimated (from 2016 aerial photography and site visits) at 15%. The latest assessment in Aug 2010 for Unit 26 Sher Brook valley found that bracken cover was also on average 10% in the assessed stops. Dense bracken cover across the wetland mosaic in the Sher Brook valley is currently estimated (from 2016 aerial	NATURAL ENGLAND. 2014; 2013; 2010. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			photography and site visits) at 25%.	
	Bare ground	Restore the cover of bare ground within the H4010 wet heath feature to at least 1% but no more than 10% cover, consisting of muddy, exposed bare ground.	Warm, dry, bare substrate close to or within heathland vegetation is important as basking, hunting, nesting and burrowing sites for certain plants, invertebrates, birds and amphibians strongly associated with dry heaths. Bare ground is defined here as soil (especially sandy, exposed soil in dry heaths and peaty soil besides open water in wet heaths) which is free of vegetation cover or litter and not subject to heavy and regular disturbance. It can be natural or man-made and should be firm, sun-lit, horizontal, sloping or vertical exposed bare ground. **Reason for restore:** the latest condition assessments recorded no bare ground in the assessed stops and there is no conservation grazing or small-scale manual scraping currently undertaken to create this bare ground micro-habitat feature.	NATURAL ENGLAND. 2014; 2013; 2010. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Key structural, influential and/or site-distinctive species: flora and fauna**	Restore the abundance of the species listed below to enable each of them to be a viable component of the H4010 wet heath feature: Constant and preferential wet heath plant species of M6, M15, M16 and M25 along with M10, M21, M22, M23, M25 & S3 vegetation types in the intimate valley bog/mire mosaic including *Erica tetralix*, *Vaccinium oxycoccus, Eriophorum angustifolium*, *Sphagnum* species, *Thelypteris thelypteroides, Drosera rotundifolia, Eleocharis quinqueflora, Narthecium ossifragum, Carex dioica, Carex lepidocarpa, Carex paniculata, Pinguicula vulgaris and Parnassia palustris.* Pending the results of future surveys for these species, restore populations of the following characteristic species of wet	Some plant or animal species (or related groups of such species) make a particularly important contribution to the structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; – *Structural* species which form a key part of the habitat's structure or help to define an Annex I habitat on a site (see also the attribute for 'vegetation community composition'). – *Influential* species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat). – *Site-distinctive* species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular site. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary. The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.	JOY, J. 2014. NATURAL ENGLAND. 2014, 2014b. MORRIS, P. 2012. SHAW, S.C. 2010. GRUNDY, D. 2007. JOY, J. 2006. GODFREY, M. & HILL, R. 2006. GODFREY, M. & HILL, R. 2006a. WEBB, J. R. & JUKES, A. 2001. ENGLISH NATURE. 1987.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		heath and associated transition areas: • Bog Bush Cricket *Metrioptera brachyptera* • Small pearl-bordered fritillary *Boloria selene* • *Gnypeta velata* wetland beetle	**Reason for restore:** the habitats on which most of these species rely are not currently in favourable condition it is reasonable to expect that these species populations are not as robust as they might be.	
	Vegetation: undesirable species	Restrict the cover of the following undesirable species across the H4010 wet heath feature at acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread: < 1% cover of exotic species such as *Rhododendron ponticum, Gaultheria shallon, Fallopia japonica*. Exotic species should be eradicated if possible. Other species in this list may be beneficial for a range of invertebrates and only become indicators of negative quality if they are over the established limit: < 1 % cover of ragwort, nettle, thistles and other herbaceous species such as *Cirsium arvense, Digitalis purpurea, Epilobium* spp. (excluding. *E. palustre*), *Chamerion angustifolium, Juncus effusus, J. squarrosus, Ranunculus spp., Senecio spp., Rumex obtusifolius, Urtica dioica*, coarse grasses.	Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.	NATURAL ENGLAND. 2014; 2013; 2010. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function	**Functional connectivity**	Restore the overall extent, quality and function of any supporting features	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation	EADES, P. PENDLETON,

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)	**with wider landscape**	within the local landscape which provide a critical functional connection with the site.	objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. **Reasons for restore:** A "restore" target has been set here for the following reasons: 1. Securing a semi-natural surface water catchment for both valleys supporting the wet heath feature will support the hydrological functioning on which the wet heath feature relies. 2. Similar/complimentary wetland habitats occur in the many valleys draining the Cannock Chase plateau, both inside and outside the SAC. Restoring linkages and habitat management across the plateau will allow landscape conservation of species closely associated with the wet heath feature mosaic such as small pearl bordered fritillary and bog bush cricket and so strengthening their populations in to the future. 3. Outside the SAC, but in close proximity to it, are several, large, high quality heathlands that were once part of the former continuous tract of Cannock Chase stretching to Sutton Park (now SSSI and National Nature Reserve) in Birmingham. These are Gentleshaw Common SSSI, Hednesford Hills and Chasewater SSSIs along with Shoal Hill Common Local Wildlife Site and smaller areas of lowland heathland throughout the area. Although now discrete heathland areas, separated from the larger Cannock Chase SAC by forestry, intensive agriculture and peri-urban development, these heathlands provide a critical functional connection to Cannock Chase SAC therefore their continued conservation and enhancement is a priority as it supports the integrity of Cannock Chase SAC. This vital network of heathlands supports species which can	E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NOAKE, B. 2014. NATURAL ENGLAND. 2014b. STAFFORDSHIRE WILDLIFE TRUST. 2013. JOY, J. 2006. GODFREY, M. & HILL, R. 2006a.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			disperse and range more widely such as birds and invertebrates, forming part of meta-populations that are important for genetic diversity and building resilience to cope with climate change. Restoring and/or creating new corridors of heathland/complimentary heathland habitats (such as wetlands, acid grassland, scrub and oakwoods (alderwoods in wet areas) between the surviving heathlands is critical to securing the integrity of the SAC into the future	
Structure and function (including its typical species)	**Adaptation and resilience**	Restore the H4010 wet heath feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. **Reason for restore: t**he vulnerability of Cannock Chase SAC <u>overall</u> to climate change has been assessed by Natural England as being low, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that this site is considered to be vulnerable overall but a lower priority for further assessment and action. A “restore” target has been set here because the site is still at risk as wetland habitats, which comprise a small but highly valuable part of the SAC, are at greater risk than the drier heathland habitats, and individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required.	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NATURAL ENGLAND, 2015; 2014b; 2014; 2013; 2010. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006.
Supporting processes (on which the feature relies)	**Conservation measures**	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the H4010 wet heath feature.	Active and ongoing conservation management is needed to restore the H4010 wet heath feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NATURAL ENGLAND.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. **Reason for restore:** in addition to the measures described under the Water Quality section below, conservation grazing is required to control the more competitive species that are a natural component of the feature such as *Molinia caerulea,* but which dominate over time due to a lack of conservation grazing (and also changes in hydrology), and to increase the vegetation's structural diversity. Lowland heathland vegetation is an especially fragile wildlife habitat and the fauna that live in it are restricted to it making them especially vulnerable to site impacts. One of the biggest threats to the special features of Cannock Chase is recreational disturbance and the direct and indirect damaging impacts it can have on the heathland's flora and fauna. Erosion, path widening, trampling, arson, pollution of soil from horse dung and dog waste can change the vegetation over time away from heathland and disturbance in the breeding season also directly harms reptiles and birds that nest on the ground in the open heathland. The Cannock Chase SAC Partnership has been created to deliver robust Strategic Access Management and Monitoring Measures (SAMMMs) to mitigate the negative effects of predicted future increases in recreational usage of the SAC from new housing development in the area.	2014b. ENGLISH NATURE, 2005.
	Soils, substrate and nutrient cycling	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal:bacterial ratio, to within typical values for the H4010 wet heath feature.	Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. This Annex 1 habitat has essentially raw soils with little humus and low nutrient status.	
	Air quality	Restore the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure	CEH. 2015. More

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		values given for the H4010 wet heath feature of the site on the Air Pollution Information System (www.apis.ac.uk).	and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH3), oxides of nitrogen (NOx) and sulphur dioxide (SO2), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. **Reason for restore:** the Critical Loads and Levels are being exceeded at present and so are a threat to the wet heath feature, causing enrichment and acidification of its vegetation.	information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool at www.apis.ac.uk)
Supporting processes (on which the feature relies)	**Water quality**	Restore surface water and/or ground water quality and quantity to a standard which provides the necessary conditions to support and restore the H4010 wet heath feature. There should be no artificial functioning drains.	For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC. **Reason for restore:** currently neither Oldacre valley nor the Sher Brook valley are functioning correctly hydrologically to support the wetland habitats present (or those expected to be there) and both are showing signs of nutrient enrichment. In	EADES, P. PENDLETON, E., TRATT, R., SHAW, S. & WHEELER, B. 2016. NATURAL ENGLAND. 2014. SHAW, S.C. 2010. GODFREY, M. & HILL, R. 2006.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			the Oldacre Valley the WW1 drainage system is still working to a certain extent/intercepting natural ground and surface water flows and so impacting on the wet heath mosaic vegetation here. In addition there may be pulses of enrichment from extant structures during heavy rainfall. The conservation measures that are required include investigating the extent and features of the World War 1 camp drainage system in the Oldacre Valley and its impact on the wet heath mosaic features with the aim of restoring to a natural as possible functioning wetland system(s) while conserving the historic World War 1 features. Impacts of altered hydrology are more substantial in the Sher Brook Valley than in the Oldacre Valley. The conservation measures that are required include investigating the hydrology of the Sher Brook Valley catchment to inform restoration options.	
Supporting processes (on which the feature relies)	**Hydrology**	Restore the natural hydrological regime at the catchment level to provide the conditions necessary to sustain the H4010 wet heath feature within the site.	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts. **Reason for restore:** the wet heath feature in both of the valleys is in poor condition due to altered (man-made) hydrological regimes. Investigations are needed into how a natural hydrological regime can be restored to restore the wet heath mosaic feature. There should be no additional artificial functioning drains.	Please see above under "Water Quality".
Version Control: Advice last updated 8 December 2017: the supporting notes for the 'functional connectivity' attribute (point 3) have been amended. 20 January 2020: supporting notes for Conservation Measures attribute has been amended.				
Variations from national feature-framework of integrity-guidance: No variation from national guidance.				

Table 2: Supplementary Advice for Qualifying Features: H4030. European dry heaths

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	**Extent of the feature within the site**	Restore the total extent of the H4030 European dry heath feature to 830 hectares	See the notes for this attribute in Table 1 above. **Reason for restore:** the existing area of dry heathland covers 750ha with a further 80ha of recent woodland (conifer plantation and secondary birch woodland) that can be easily restored to heathland over time. There is also c.260ha of site fabric within the SSSI boundary and expansion of the heathland feature into this mainly mixed plantation would be a welcome addition to the heathland area.	NATURAL ENGLAND. 2014. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Spatial distribution of the feature within the site	Restore the distribution and configuration of the H4030 European dry heath feature, including where applicable its component vegetation types, across the site.	See the notes for this attribute in Table 1 above. **Reason for restore:** please see above under "Extent".	
Structure and function (including its typical species)	**Vegetation community composition**	Ensure the component vegetation communities of the H4030 European dry heath feature are broadly referable to and characterised by the following National Vegetation Classification types: H8 *Calluna vulgaris-Ulex gallii* heath H9 *Calluna vulgaris - Deschampsia flexuosa*. heath	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Vegetation community transitions	Maintain areas of transition between the H4030 European dry heath feature and communities which form other heathland-associated habitats (such as	Transitions and zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities.	NATURAL ENGLAND. 2014.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		dry and humid heaths, mires, acid grasslands, scrub and woodland).	Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.	This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation structure: cover of dwarf shrubs**	Restore an overall cover of dwarf shrub species across the H4030 European dry heath feature which is typically between 60 - 80%. Dwarf-shrubs include*: Calluna vulgaris, Empetrum nigrum, E. cinerea, E. tetralix, Ulex gallii, Vaccinium myrtillus, V. vitis-idaea* (and hybrids).	Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) are needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. The structural character of the heathland feature is strongly influenced by the growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families). The ericaceous species heather or ling *Calluna vulgaris*, bell heather *Erica cinerea*, cross-leaved heath *Erica tetralix*, Dorset heath *Erica ciliaris*, Cornish heath *Erica vagans*, bilberry or blaeberry *Vaccinium myrtillus* and cowberry *Vaccinium vitis-idaea* are the commonest and most characteristic dwarf-shrubs. Hybrids of Dorset and cross-leaved heath and of bilberry and cowberry can be locally abundant. *Calluna* is usually the most abundant. Crowberry *Empetrum nigrum*, another common species in some coastal and transitional heaths, is not strictly ericaceous but is often treated as an ericoid species. **Reason for restore:** in northern and eastern parts of the SAC the cover of dwarf shrubs are below the target though due to dense bracken and/or trees/scrub dominating in these areas.	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014; 2015; 2016. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Vegetation composition: bracken cover	Reduce the cover of dense bracken across the H4030 European dry heath feature to a typically low level of between 1 - 10%.	The spread of bracken *Pteridium aquilinum* is a problem on many lowland heathlands. The unpalatable nature and density of bracken as a tall-herb fern, and its decomposing litter, can smother and shade out smaller and more characteristic heathland vegetation. Active management of bracken is usually required to reduce or contain its cover across this habitat feature. But this fern has also some nature conservation value, for example on sites where fritillary butterflies occur and utilise bracken litter habitat.	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014; 2015; 2016. This attribute will be

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Reason for restore: dense bracken cover across the whole dry heath feature at Cannock Chase is currently conservatively estimated (from 2016 aerial photography and site visits) at just over 10%.	periodically monitored as part of Natural England's SSSI condition assessments.
Structure and function (including its typical species)	**Vegetation structure: cover of gorse**	Maintain the cover of common gorse *Ulex europaeus* at <25% and the combined cover of *U.europaeus* and *U.gallii* at <50% of the whole H4030 European dry heath feature.	Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining bird species, and excellent winter roosting. The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators. However gorse may cause problems if unchecked by dominating an area, eliminating other typical heathland species. Extensive mature stands may also be serious fire hazards.	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014; 2015; 2016. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Vegetation structure: tree cover	Restore the open character of the H4030 European dry heath feature, with a typically scattered and low cover of trees and scrub of between 5 - 15%.	Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are usually very important in providing warmth, shelter, cover, food plants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this habitat feature should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. If scrub is locally important for any associated species with their own specific conservation objectives, then a higher level of cover will be acceptable. The area of scrub/tree cover should be stable or not increasing as a whole. **Reason for restore:** although current tree and scrub cover across the whole dry heath feature is conservatively estimated (from 2016 aerial photography and site	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014; 2015; 2016. This attribute will be periodically monitored as part of Natural England's SSSI condition

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			visits) at nearly 13%, there are areas of potential heathland habitat will benefit from restoration by further opening up of pine plantations at Moors Gorse and Brindley Heath. Current tree and scrub cover mainly comprises mature scrub, woodland and single mature birch trees, many of which are important for the rare Welsh clearwing moth. It would be beneficial to heathland fauna to restore a shifting mosaic of young scattered trees, thickets and scrub to provide microhabitats	assessments.
Structure and function (including its typical species)	**Vegetation structure: heather age structure**	Restore a diverse age structure amongst the ericaceous shrubs typically found across the H4030 European dry heath feature.	Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather in different phases of growth. Typically this age structure will consist of between 10-40% cover of (pseudo) pioneer heathers; 20-80% cover of building/mature heathers; <30% cover of degenerate heathers and less than <10% cover of dead heathers. **Reason for restore:** there is an overall lack of pioneer heather across the dry heath feature. Most of the heather is in the building-mature stage, moving into degenerate stage.	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014; 2015; 2016. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Vegetation: undesirable species	Restrict the cover of the following undesirable species across the H4030 European dry heath feature to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread: < 1% cover of exotic species such as *Rhododendron ponticum, Gaultheria shallon, Fallopia japonica*. Exotic	Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.	NATURAL ENGLAND, 2010; 2011; 2012; 2013, 2014; 2015; 2016. This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		species should be eradicated if possible. Other species in this list may be beneficial for a range of invertebrates and only become indicators of negative quality if they are over the established limit: < 1 % cover of ragwort, nettle, thistles and other herbaceous species such as *Cirsium arvense, Digitalis purpurea, Epilobium* spp. (excluding. *E. palustre*), *Chamerion angustifolium, Juncus effusus, J. squarrosus, Ranunculus spp., Senecio spp., Rumex obtusifolius, Urtica dioica*, coarse grasses.		England's SSSI condition assessments.
Structure and function (including its typical species)	**Bare ground**	Restore the cover of bare ground within the H4030 European dry heath feature to at least 1% but no more than 10% cover, consisting of at least 0.5% horizontal and 0.5% vertical bare ground.	Warm, dry, bare substrate close to or within heathland vegetation is important as basking, hunting, nesting and burrowing sites for certain plants, invertebrates, birds and amphibians strongly associated with dry heaths. Bare ground is defined here as soil (especially sandy, exposed soil in dry heaths and peaty soil besides open water in wet heaths) which is free of vegetation cover or litter and not subject to heavy and regular disturbance. It can be natural or man-made and should be firm, sun-lit, horizontal, sloping or vertical exposed bare ground. **Reason for restore:** the latest condition assessments recorded insufficient bare ground across the feature. Edges of paths and tracks total just under 1% at most and therefore active management is needed to boost this micro-habitat resource across the dry heath feature.	NATURAL ENGLAND. 2014. NATURAL ENGLAND. 2013. NATURAL ENGLAND. 2010. This attribute will be periodically monitored as part of Natural England's SSSI condition assessments.
	Key structural,	Restore the abundance of the species listed below to enable each of them to	See the Supporting/Explanatory Notes for this attribute above in table 1.	JOY, J. 2014. LOWE, A.,

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	influential and/or site-distinctive species: flora and fauna	be a viable component of the H4030 European dry heath feature: Constant and preferential plant species of the H8 and H9 vegetation types. Population of *Vaccinium intermedium.* Assemblage of heathland invertebrates associated with unshaded, early successional mosaics (such as solitary bees and wasps). Assemblage of heathland breeding birds, including Dartford warbler *Sylvia undata,* nightjar *Caprimulgus europaeus*, woodlark *Lullula arborea*. Assemblage of native reptiles: adder *Vipera berus,* common lizard *Zootoca vivipara,* grass snake *Natrix helvetica*, slow worm *Anguis fragilis*. Population of Bog Bush Cricket *Metrioptera brachyptera.*	**Reason for restore:** the habitats on which most of these species rely are not currently in favourable condition. It is reasonable to expect that these species populations are not as robust as they might be. Across the SAC there are few large areas of uninterrupted or undisturbed habitat; for example the average area of habitat between paths/tracks is about 6ha. This can have implications for characteristic, ground-nesting heathland birds such as nightjar and woodlark (Lowe *et al*. 2014)	ROGERS, A.C. AND DURRANT, K.L. 2014. NATURAL ENGLAND. 2014. NATURAL ENGLAND. 2014b. MORRIS, P. 2012. SHAW, S.C. 2010. GRUNDY, D. 2007. BENNETT, J.S. 2007. WEBB, J. R. & JUKES, A. 2001. ENGLISH NATURE. 1987.
Structure and function (including its typical species)	**Functional connectivity with wider landscape**	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site.	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely.	NOAKE, B. 2014. STAFFORDSHIRE WILDLIFE TRUST. 2013. NATURAL ENGLAND. 2013.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. **Reason for restore:** A "restore" target has been set here for three reasons: 1. Although good heathland corridors have been created on former Forest Enterprise commercial forestry land and managed by conservation grazing to connect formerly fragmented parts of the SAC, there may be opportunities to extend these and/or create new corridors of heathland/complimentary heathland habitats* to increase the functional connectivity with the SAC to allow the site to be as resilient as possible into the future. 2. Surrounding the SAC is Cannock Forest, managed by Forest Enterprise for commercial timber production. The clear-fell management system has provided nightjar and woodlark with favourable nesting habitat, the continuity of which across the landscape is vital for the survival of the important populations of these rare birds in the Midlands. 3. Outside the SAC, but in close proximity to it, are several, large, high quality heathlands that were once part of the former continuous tract of Cannock Chase stretching to Sutton Park (now SSSI and National Nature Reserve) in Birmingham. These are Gentleshaw Common SSSI, Hednesford Hills and Chasewater SSSIs along with Shoal Hill Common Local Wildlife Site and smaller areas of lowland heathland throughout the area. Although now discrete heathland areas, separated from the larger Cannock Chase SAC by forestry, intensive agriculture and peri-urban development, these heathlands provide a critical functional connection to Cannock Chase SAC therefore their continued conservation and enhancement is a priority as it supports the integrity of Cannock Chase SAC. This vital network of heathlands supports species which can disperse and range more widely such as birds and invertebrates, forming part of meta-populations that are important for genetic diversity and building resilience to cope with climate change. Restoring and/or creating new corridors of heathland/complimentary heathland habitats (such as acid grassland, scrub and oakwoods (alderwoods in wet areas) between the surviving heathlands is critical to securing the integrity of the SAC into	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			the future	
Structure and function (including its typical species)	**Adaptation and resilience**	Restore the H4030 European dry heath feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability. **Reason for restore: t**he vulnerability of Cannock Chase SAC <u>overall</u> to climate change has been assessed by Natural England as being *low*, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that this site is considered to be vulnerable overall but a lower priority for further assessment and action. A “restore” target has been set here because most of the land between the SAC and the other high quality heathlands in the local landscape is now urban development, intensive farming and forestry. To make the SAC and its typical species become more resilient in the face of climate change and other impacts and threats, we need to reconnect isolated heathland sites together. Where possible, land adjacent to existing heathland should be restored to lowland heathland and associated habitats such as wetland, acid grassland, scrub and oak-woods (alder-woods in wet areas).	CANNOCK CHASE SAC PARTNERSHIP. 2016. NATURAL ENGLAND. 2010; 2011; 2012; 2013; 2014; 2014b, 2015
Structure and function (including its typical species)	**Soils, substrate and nutrient cycling**	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio, to within typical values for the H4030 European dry heath habitat.	Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. **Reason for restore:** there is evidence to suggest that the soils at Cannock Chase	CEH. 2015.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			are vulnerable to acidification.	
Supporting processes (on which the feature relies)	**Conservation measures**	Restore the management measures within (and outside the site boundary where required) which are necessary to restore the structure, functions and supporting processes associated with the H4030 European dry heath feature.	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. **Reason for restore: c**ontinuing existing conservation management and new conservation grazing, subject to ongoing public consultation, will contribute hugely to achieving favourable conservation status of the dry heath feature by increasing nutrient removal from the heathland, help create a mosaic of habitats and improving functioning of the heathland ecosystem. Lowland heathland vegetation is an especially fragile wildlife habitat and the fauna that live in it are restricted to it making them especially vulnerable to site impacts. One of the biggest threats to the special features of Cannock Chase is recreational disturbance and the direct and indirect damaging impacts it can have on the heathland's flora and fauna. Erosion, path widening, trampling, arson, pollution of soil from horse dung and dog waste can change the vegetation over time away from heathland and disturbance in the breeding season also directly harms reptiles and birds that nest on the ground in the open heathland. The Cannock Chase SAC Partnership will deliver the Strategic Access Management Measures required to mitigate for the increase in recreational impacts from new housing in the area, allowing the measures detailed in the structure and function and supporting processes sections of the Supplementary Advice to have maximum positive effect on the dry heath feature so improving its resilience into the future.	STAFFORDSHIRE COUNTY COUNCIL. 2016. NATURAL ENGLAND, 2010; 2011; 2012; 2013; 2014b. ENGLISH NATURE, 2005.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Ongoing monitoring of and new research into the *Phytophthora pseudosyringae* infection in bilberry *Vaccinium myrtillus* is required to better understand its ecology for control and overall site management purposes.	
Supporting processes (on which the feature relies)	**Air quality**	Restore the concentrations and deposition of air pollutants to within 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).	See the Supporting/Explanatory Notes for this attribute above in table 1. **Reason for restore:** the Critical Loads and Levels are currently being exceeded at present and are a threat to the dry heath feature, causing enrichment and acidification of the soil beyond the expected pH for a lowland heathland soil.	CEH. 2015. More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool at www.apis.ac.uk
Version Control: Advice last updated 8 December 2017: the supporting notes for the 'functional connectivity' attribute (point 3) have been amended 20 January 2020: supporting notes for Conservation Measures attribute has been amended.				
Variations from national feature-framework of integrity-guidance: The following attributes are not relevant to this feature at this site: • Supporting processes (on which the feature relies) – Water Quality • Supporting processes (on which the feature relies) – Hydrology				

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APPENDIX 11

Site Improvement Plan for Cannock Chase SAC

Improvement Programme for England's Natura 2000 Sites (IPENS)

Planning for the Future

Site Improvement Plan

Cannock Chase

Site Improvement Plans (SIPs) have been developed for each Natura 2000 site in England as part of the Improvement Programme for England's Natura 2000 sites (IPENS). Natura 2000 sites is the combined term for sites designated as Special Areas of Conservation (SAC) and Special Protected Areas (SPA). This work has been financially supported by LIFE, a financial instrument of the European Community.

The plan provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site(s) and outlines the priority measures required to improve the condition of the features. It does not cover issues where remedial actions are already in place or ongoing management activities which are required for maintenance.

The SIP consists of three parts: a Summary table, which sets out the priority Issues and Measures; a detailed Actions table, which sets out who needs to do what, when and how much it is estimated to cost; and a set of tables containing contextual information and links.

Once this current programme ends, it is anticipated that Natural England and others, working with landowners and managers, will all play a role in delivering the priority measures to improve the condition of the features on these sites.

The SIPs are based on Natural England's current evidence and knowledge. The SIPs are not legal documents, they are live documents that will be updated to reflect changes in our evidence/knowledge and as actions get underway. The information in the SIPs will be used to update England's contribution to the UK's Prioritised Action Framework (PAF).

The SIPs are not formal consultation documents, but if you have any comments about the SIP or would like more information please email us at IPENSLIFEProject@naturalengland.org.uk, or contact Natural England's Responsible Officer for the site via our enquiry service 0300 060 3900, or enquiries@naturalengland.org.uk

This Site Improvement Plan covers the following Natura 2000 site(s)

UK0030107 Cannock Chase SAC

Site description

Cannock Chase is a large, diverse area of semi-natural vegetation comprising the most extensive area of lowland heathland in the Midlands with alder woodland, oak wood pasture and valley mires. It is home to breeding Nightjar, Woodlark, occasionally Dartford warbler and a diverse invertebrate fauna. The character of the vegetation is intermediate between the upland or northern heaths of England and Wales and those of southern counties.

Cannock Chase Special Area of Conservation is also a Country Park and lies in the heart of Cannock Chase Area of Outstanding Natural Beauty. Given its location it is a popular outdoor recreation destination and is subject to high visitor pressure. The Cannock Chase SAC Partnership has been set up to deliver robust access management measures to mitigate the negative effects of predicted future increases in recreational usage of the SAC. Current management of SAC land is targeted at restoring and strengthening the heathland vegetation mosaics.

Plan Summary

This table shows the prioritised issues for the site(s), the features they affect, the proposed measures to address the issues and the delivery bodies whose involvement is required to deliver the measures. The list of delivery bodies will include those who have agreed to the actions as well as those where discussions over their role in delivering the actions is on-going.

Priority & Issue	Pressure or Threat	Feature(s) affected	Measure	Delivery Bodies
1 Undergrazing	Pressure	H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths	Introduce grazing	Cannock Chase AONB, Forest Enterprise, Natural England, RSPB, Staffordshire County Council, Defence Infrastructure Organisation (DIO), CEMEX UK
2 Drainage	Pressure	H4010 Wet heathland with cross-leaved heath	Investigate the water supply to the wetland habitats in the Oldacre Valley, including the impact of the WW1 camp drainage system	Cannock Chase AONB, Environment Agency, Natural England, Staffordshire County Council, English Heritage
3 Hydrological changes	Pressure	H4010 Wet heathland with cross-leaved heath	Investigate the hydrology of the Sher Brook Valley and restore where possible	Environment Agency, Forest Enterprise, Natural England, Staffordshire County Council, UK Coal

4 Disease	Pressure	H4030 European dry heaths	Extend Phytophthora pseudosyringae monitoring to all Special Area of Conservation land to gather more data to aid understanding about the disease and long-term impacts	Defra, Forest Enterprise, Natural England, RSPB, Staffordshire County Council, Defence Infrastructure Organisation (DIO), University(ies), Food and Environment Research Agency (FERA), CEMEX UK
5 Air Pollution: impact of atmospheric nitrogen deposition	Pressure	H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths	Control, reduce and ameliorate atmospheric nitrogen impacts on the whole of Cannock Chase SAC	Not yet determined
6 Wildfire/ arson	Pressure	H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths	Update fire plans, review of the effectiveness of existing fire-breaks, and raise awareness with the public of the damage of accidental fires on heathland	Forest Enterprise, Natural England, RSPB, Staffordshire County Council, Defence Infrastructure Organisation (DIO), Staffordshire Fire and Rescue Service , CEMEX UK
7 Invasive species	Pressure	H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths	Continue to monitor and control Invasive Non-Native Species (INNS)	Cannock Chase AONB, Forest Enterprise, Natural England, Staffordshire County Council, Defence Infrastructure Organisation (DIO), CEMEX UK

Issues and Actions

This table outlines the prioritised issues that are currently impacting or threatening the condition of the features, and the outstanding actions required to address them. It also shows, where possible, the estimated cost of the action and the delivery bodies whose involvement will be required to implement the action. Lead delivery bodies will be responsible for coordinating the implementation of the action, but not necessarily funding it. Delivery partners will need to support the lead delivery body in implementing the action. In the process of developing the SIPs Natural England has approached the delivery bodies to seek agreement on the actions and their roles in delivering them, although in some cases these discussions have not yet been concluded. Other interested parties, including landowners and managers, will be involved as the detailed actions are agreed and delivered. Funding options are indicated as potential (but not necessarily agreed or secured) sources to fund the actions.

1 Undergrazing

Cannock Chase Special Area of Conservation needs conservation grazing by appropriate animals to build on the restoration of the dry and wet heathland habitats and address a number of management issues. Grazing animals such as cattle will diversify the physical structure of the heathland habitats by creating habitat mosaics across the site that in turn will benefit the special fauna at Cannock Chase. The presence of the plant fungal disease *Phytophthora pseudosyringae* on bilberry has stalled the reintroduction of grazing to the main body of the Chase due to time and resources being diverted to controlling this little-known disease but also due to concerns that grazing would spread the disease around the site. After five years of disease monitoring and treatment, we have a better understanding of the disease and how it moves around County land. It is now time to use and build on this research, and to build on the grazing research already carried out, to devise a grazing plan for Cannock Chase that will pose no greater risk to spreading the disease than the risk posed by people, dogs and deer.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1A	Develop a conservation grazing plan for Staffordshire County Council SAC land with built-in biosecurity to minimise spread of *Phytophthora pseudosyringae*. Carry out public consultation on the plan in line with Commons Act legislation.	£60,000	2015-18	Non-Natural England funded site management plan	Not yet determined	Natural England	Cannock Chase AONB, Staffordshire County Council

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1B	Implement the conservation grazing plan on Staffordshire County Council SAC land with built-in biosecurity to minimise spread of *Phytophthora pseudosyringae*.	Not yet determined	2018-25	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Not yet determined	Natural England	Cannock Chase AONB, Staffordshire County Council

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1C	Draw up and implement a conservation grazing plan for CEMEX SAC land. The RSPB will provide ongoing advisory and practical support for improved management and restoration of heathland in partnership with CEMEX at Cannock Chase.	Not yet determined	2015-20	Rural Development Programme for England (RDPE): Common Agricultural Policy 2014-20 (New Environmental Land Management Scheme)	Not yet determined	Natural England	Cannock Chase AONB, RSPB, CEMEX UK

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1D	Draw up and implement a conservation grazing plan for Forest Enterprise SAC land.	Not yet determined	2015-20	Major Landowner Group land ownership activities : Undertake Specific Management Works	Not yet determined	Natural England	Forest Enterprise

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
1E	Draw up and implement a conservation grazing plan for Ministry of Defence SAC land.	Not yet determined	2015-20	Major Landowner Group land ownership activities : Undertake Specific Management Works	Not yet determined	Natural England	Defence Infrastructure Organisation (DIO)

2 Drainage

The water supply to the wetland habitats needs further investigation and there are artificial, historic drainage structures in the Oldacre Valley that need to be assessed to establish their impact on the wetland vegetation.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2A	Investigate the extent and features of the World War 1 camp drainage system in Oldacre Valley.	£25,000	2015-17	Conservation Enhancement Scheme (CES)	Not yet determined	Natural England	Cannock Chase AONB, Staffordshire County Council, English Heritage

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2B	Investigate the water supply to the wetland habitats in the Oldacre Valley including the effects of the World War 1 camp drainage system.	£50,000	2015-18	Conservation Enhancement Scheme (CES)	Not yet determined	Natural England	Environment Agency, Staffordshire County Council, English Heritage

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
2C	Restore to as natural as possible a functioning wetland system(s) in the Oldacre Valley while conserving the historic World War 1 features.	£30,000	2019-20	Habitat creation / restoration strategy: Habitat restoration	Conservation Enhancement Scheme (CES)	Natural England	Cannock Chase AONB, Environment Agency, Staffordshire County Council, English Heritage

3 Hydrological changes

There has been a reduction in the extent of the valley mire and changes in the vegetation in the Sher Brook Valley which indicate a move towards a drier wetland vegetation. Investigations are needed into why this is happening and what can be done to rectify it.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
3A	Investigate the hydrology of the Sher Brook catchment to inform restoration options.	£50,000	2015-20	Investigation / Research / Monitoring	Defra, EU Life, Natural England	Natural England	Environment Agency, Forest Enterprise, Staffordshire County Council, UK Coal

4 Disease

The fungal plant disease *Phytophthora pseudosyringae* is widespread on several parts of the main body of the Chase, affecting bilberry, a major part of the heathland vegetation. Monitoring of disease spread has so far focussed on County land but there is a need to understand if and how the disease is spreading on the other parts of the Special Area of Conservation.
The disease outbreak on Cannock Chase is the worst in the country and with 5 years-worth of disease monitoring and treatment data on County land available, there is an opportunity to build on this evidence base to understand the disease in greater detail, its long-term effects on the vegetation composition of the Special Area of Conservation and devise an effective control plan to stop the spread of the disease. The results of this research should be incorporated into all current and future management plans for the site.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4A	Continue with annual monitoring and control of *Phytophthora pseudosyringae* on Staffordshire County Council SAC land.	£60,000	2014-20	Conservation Enhancement Scheme (CES)	Not yet determined	Natural England	Staffordshire County Council

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4B	Investigate hotspots of *Phytophthora pseudosyringae* infection on Staffordshire County Council SAC land to devise solutions for reducing the level of infection in these areas and spread to others.	£25,000	2015-20	Investigation / Research / Monitoring	Defra, EU Life, Natural England	Natural England	Defra, Staffordshire County Council, University(ies), Food and Environment Research Agency (FERA)

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4C	Carry out monitoring of *Phytophthora pseudosyringae* on CEMEX SAC land to gather more data to aid understanding about the disease. The RSPB will provide ongoing advisory and practical support for improved management and restoration of heathland in partnership with CEMEX at Cannock Chase.	£12,000	2014-20	Conservation Enhancement Scheme (CES)	Not yet determined	Natural England	RSPB, CEMEX UK

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4D	Carry out monitoring of *Phytophthora pseudosyringae* on Forest Enterprise SAC land to gather more data to aid understanding about the disease. Consider extending the monitoring to Forest Enterprise non-SAC land where bilberry is present to gather more data about how widespread the disease is across Cannock Chase.	£60,000	2014-20	Conservation Enhancement Scheme (CES)	Not yet determined	Natural England	Forest Enterprise

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
4E	Carry out monitoring of *Phytophthora pseudosyringae* on Ministry of Defence SAC land to gather more data to aid understanding about the disease.	£1,500	2014-20	Conservation Enhancement Scheme (CES)	Not yet determined	Natural England	Defence Infrastructure Organisation (DIO)

5 Air Pollution: impact of atmospheric nitrogen deposition

Nitrogen deposition on Cannock Chase Special Area of Conservation currently exceeds the relevant critical loads for the site. Possible effects of this seen on the ground include an increase in bramble across the site and a shorter *Calluna vulgaris* lifecycle resulting in the plants ageing faster.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
5A	Control, reduce and ameliorate atmospheric nitrogen impacts on the whole of Cannock Chase SAC.	Not yet determined	2014-20	Site Nitrogen Action Plan	Not yet determined	Not yet determined	Not yet determined

6 Wildfire/ arson

Accidental and deliberate fires have caused massive damage to Cannock Chase over the decades. Ensuring that the existing fire break network is robust and restoration plans post-fire are in place will help areas recover quicker. Raising awareness with the public will reduce fires in the future.

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
6A	Review the existing fire break network and post-fire restoration plan for Staffordshire County Council SAC land, ensuring fire breaks do not damage or intercept springs or other sensitive features.	No costs, done in-house	2014-15	Existing Local Project	No net cost	Staffordshire County Council	Natural England, Staffordshire Fire and Rescue Service

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
6B	Review the existing fire break network and post-fire restoration plan for CEMEX SAC land at Rugeley Heath, ensuring fire breaks do not intercept or damage springs or other sensitive features. The RSPB will provide ongoing advisory and practical support for improved management and restoration of heathland in partnership with CEMEX at Cannock Chase.	No costs, done in-house	2014-15	Mechanism not identified / develop mechanism	No net cost	CEMEX UK	Natural England, RSPB, Staffordshire Fire and Rescue Service

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
6C	Review the existing fire break network and post-fire restoration plan for Forest Enterprise SAC land, ensuring fire breaks do not intercept or damage springs or other sensitive features.	No costs, done in-house	2014-15	Mechanism not identified / develop mechanism	No net cost	Forest Enterprise	Staffordshire Fire and Rescue Service

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
6D	Review the existing fire break network and post-fire restoration plan for Ministry of Defence SAC land, ensuring fire breaks do not intercept or damage springs or other sensitive features.	No costs, done in-house	2014-15	Mechanism not identified / develop mechanism	No net cost	Defence Infrastructure Organisation (DIO)	Staffordshire Fire and Rescue Service

7 Invasive species

A range of invasive species are present on the SAC and on surrounding land. Monitoring and controlling the spread of certain aggressive species is vital to prevent damage to the dry and wet heath communities. Raising awareness with neighbouring landowners about the damage such species can cause and how they can help prevent the risk of spread of invasive species is needed too.

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
7A	Monitor and control all non-native invasive species on Staffordshire County Council SAC land.	No costs, done in-house	2014-20	Invasive Control Plan: Invasive Species Control Programme	No net cost	Staffordshire County Council	Cannock Chase AONB, Natural England

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
7B	Monitor and control all non-native invasive species on CEMEX SAC land at Rugeley Heath. The RSPB will provide ongoing advisory and practical support for improved management and restoration of heathland in partnership with CEMEX at Cannock Chase.	No costs, done in-house	2014-20	Invasive Control Plan: Invasive Species Control Programme	No net cost	CEMEX UK	Cannock Chase AONB, Natural England

Action	Action description	Cost estimate	Timescale	Mechanism	Funding option	Delivery lead body	Delivery partner(s)
7C	Monitor and control all non-native invasive species on Forest Enterprise SAC land.	No costs, done in-house	2014-20	Invasive Control Plan: Invasive Species Control Programme	No net cost	Forest Enterprise	Cannock Chase AONB, Natural England

Action	*Action description*	*Cost estimate*	*Timescale*	*Mechanism*	*Funding option*	*Delivery lead body*	*Delivery partner(s)*
7D	Monitor and control all non-native invasive species on Ministry of Defence SAC land.	No costs, done in-house	2014-20	Invasive Control Plan: Invasive Species Control Programme	No net cost	Defence Infrastructure Organisation (DIO)	Cannock Chase AONB, Natural England

Site details

The tables in this section contain site-relevant contextual information and links

Qualifying features

#UK Special responsibility

Cannock Chase SAC	H4010 Northern Atlantic wet heaths with *Erica tetralix* H4030 European dry heaths

Site location and links

Cannock Chase SAC

Area (ha) **1236.93** *Grid reference* **SJ982188**	Map link
Local Authorities	Staffordshire
Site Conservation Objectives	European Site Conservation Objectives for Cannock Chase SAC
European Marine Site conservation advice	n/a
Regulation 33/35 Package	n/a
Marine Management Organisation site plan	n/a

Water Framework Directive (WFD)

The Water Framework Directive (WFD) provides the main framework for managing the water environment throughout Europe. Under the WFD a management plan must be developed for each river basin district. The River Basin Management Plans (RMBP) include a summary of the measures needed for water dependent Natura 2000 sites to meet their conservation objectives. For the second round of RBMPs, SIPs are being used to capture the priorities and new measures required for water dependent habitats on Natura 2000 sites. SIP actions for non-water dependent sites/habitats do not form part of the RBMPs and associated consultation.

Cannock Chase SAC

River basin	Humber RBMP
WFD Management catchment	Staffordshire Trent Valley
WFD Waterbody ID (Cycle 2 draft)	n/a

Overlapping or adjacent protected sites

Site(s) of Special Scientific Interest (SSSI)	
Cannock Chase SAC	Cannock Chase SSSI

National Nature Reserve (NNR)	
Cannock Chase SAC	n/a

Ramsar	
Cannock Chase SAC	n/a

Special Areas of Conservation (SAC) and Special Protection Areas (SPA)	
Cannock Chase SAC	n/a

Version	*Date*	*Comment*
1.0	17/10/14	

APPENDIX 12

Watling Street Business Park – Technical Note on Air Quality

Air Quality Note:
Watling Street Business Park

February 2023

Experts in air quality management & assessment

Document Control

Client	St Modwen	**Principal Contact**	Charlie Elliott

Job Number	J10/12516B/10

Report Prepared By:	Isabel Stanley and Adam Dawson

Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J10/12516B/10/1/F1	3 February 2023	Final	Penny Wilson (Associate Director)

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1 Introduction

1.1 This Technical Note considers the potential air quality impacts upon human and ecological receptors, associated with the allocation of the Watling Street Business Park (the Site) within the emerging Cannock Chase Local Plan.

2 Human Health

2.1 Watling Street Business Park (the Site) was initially given a - - score for "Pollution" in the Sustainability Appraisal. With respect to air quality, this is due to the proximity to an AQMA. The length of the A5 through Cannock Chase has been designated an AQMA. However, this does not mean that the air quality objectives are currently being exceeded along its entire length, nor that this will continue to be the case throughout the lifetime of the plan.

2.2 Although challenged, the March 2021 Integrated Impact Assessment[1] stated that, *"In relation to SA objective 2, air pollution has been considered in terms of the potential for development to result in higher levels of traffic occurring within declared AQMAs. Due to the strategic nature of SA it is considered that this approach is proportionate. Site CE20 is located within very close proximity of the A5 where an AQMA has been declared. It is considered most probable that access to the site would be provided directly via the A5 or via Lime Lane which connects to that route by The Turf roundabout. A significant negative effect has therefore been recorded in relation to this SA objective."*

2.3 All employment sites have been given a negative score for air pollution with the exception of RE2(a), where it is stated that it *"is unlikely to be affected by adverse impacts of this nature considering that it is not within or linked to an AQMA or in close proximity to the strategic road network."*

2.4 However, Cannock Chase's own Air Quality Annual Status Report 2021[2] notes that:

"Improvements in monitored nitrogen dioxide levels continue to be recorded. However, 2020 has been an abnormal year due to reduced traffic levels during lockdown and for some time thereafter. Never-the-less levels are commensurate with ongoing improvements observed for several years and indicate that AQMAs 1 and 3 are complying with AQOs and can be revoked."

[1] https://www.cannockchasedc.gov.uk/sites/default/files/cannock_chase_local_plan_preferred_options_sustainability_appraisal_health_impact_assessment_march_2021_1.pdf

[2] Cannock Chase Council (2021) 2021 Air Quality Annual Status Report

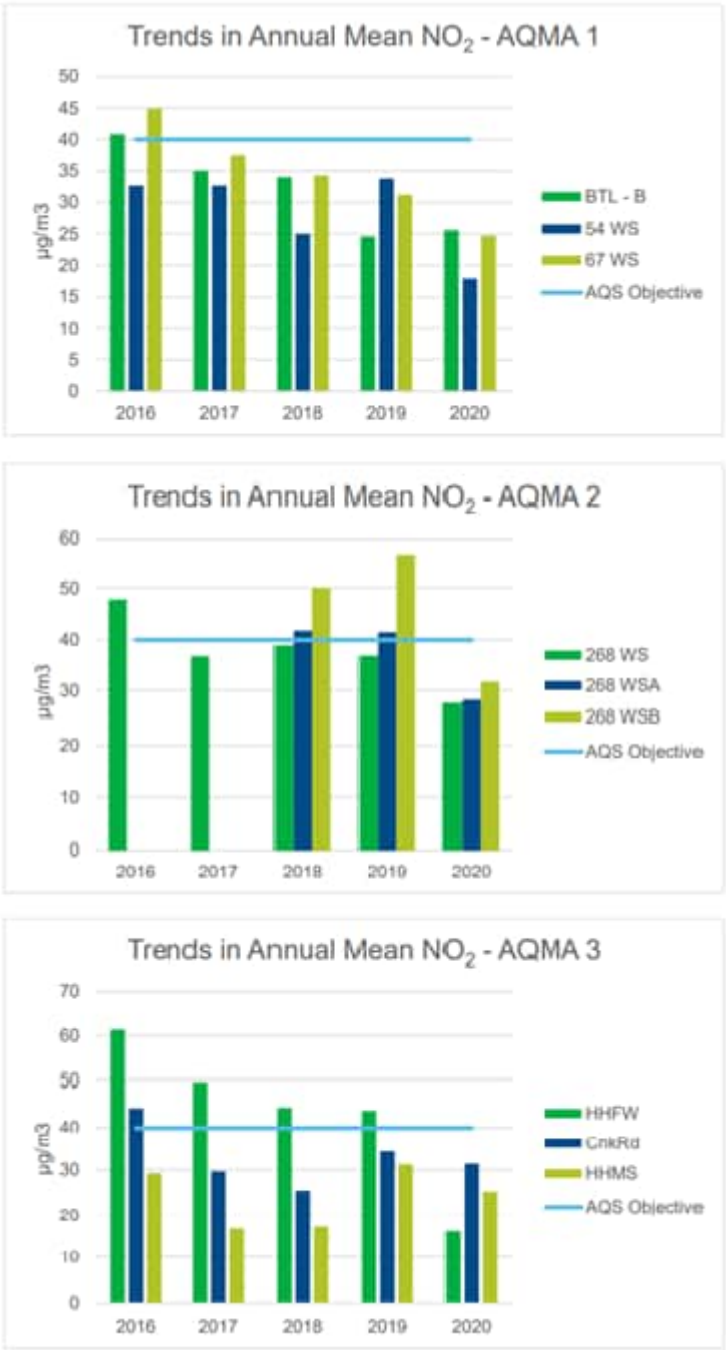

Figure 1: Monitoring Data Trend within Nearby AQMA's[2]

2.5 As set out in Paragraph 2.1, it is unreasonable to determine the impact of development of a particular site upon air quality based purely on proximity to an AQMA. There are two reasons for this:

- The presence of an AQMA does not necessarily mean that the air quality objectives are being exceeded; and
- Concentrations are anticipated the reduce during the plan period.

2.6 Specifically, in relation to site CE 20 impact on the nearby AQMA, monitoring (268 WS) near to one of the few properties that could be most affected, indicates that the annual mean nitrogen dioxide objective has been achieved for a number of years.

2.7 A summary of AQMAs in the vicinity of Watling Street Business Park is set out in Table 1 below. The only AQMA where concentrations currently exceed the objective and there is relevant exposure is the Five Ways Island. However, detailed dispersion modelling has been carried out for this AQMA and demonstrated that there were no exceedances of the annual mean nitrogen dioxide objective at locations of relevant exposure within AQMA 3 in 2019. Subject to further work on future development, this AQMA is also being considered for revocation.

Table 1: List of AQMAs

Local Authority	AQMA	Concentrations [3]	Revoke/Retain
Cannock	AQMA 2 – A5 Watling St East (section closest to Business Park	268 WS is the relevant tube = 37 µg/m^3 in 2019	Not recommended to be revoked until relevant exposure remains below the objective in the future.
Cannock	AQMA 1 – A5 Watling St West	54 WS is the relevant tube = 31.2 µg/m^3 in 2019	It is recommended that Cannock Chase AQMA (AQMA 1) is revoked.
Cannock	AQMA 3 – Five Ways Island	HHFW is the relevant tube = 43.9 µg/m^3 in 2019	Detailed dispersion modelling has been carried out for AQMA 3, which has demonstrated that there were no exceedances of the annual mean nitrogen dioxide objective at locations of relevant exposure within AQMA 3 in 2019, and therefore this AQMA should also be revoked.
Walsall	Whole borough	Exceedances only in centre of Walsall	Retain
South Staffordshire	AQMA No.4 Wedges Mills	30 µg/m^3 in 2018	REVOKED
South Staffordshire	AQMA No. 5 Oak Farm	35.4 µg/m^3 in 2018	Retain
Objective		**40 µg/m^3**	**-**

2.8 While all exceedances within the borough-wide Walsall AQMA are in the centre, away from the Site, due to the magnitude of traffic[4] predicted to enter the Walsall AQMA from the scheme being well

[3] Whilst the 2021 Annual Status Report (containing 2020 monitoring data) has been published, 2020 results have not been presented in this note, due to the impact of the covid-19 pandemic affecting travel patterns throughout the UK.

[4] The impacts of the maximum trip generation for the site (assuming entirely 50,000 m^2 of B8 use) have been assessed; this is a worst-case approach.

above published industry screening thresholds[5], detailed modelling has been undertaken. Due to the reasons stated above, it is not considered necessary to model an extensive study area. Three worst-case receptor locations adjacent to the A5 (Watling Road) in the Walsall AQMA have been selected, with three additional receptors adjacent to the A5 AQMAs and Lime Lane included for completeness (see Figure 2). The receptor selection accounts for proximity to junctions, where traffic may become congested and where there is a combined effect of several road links.

2.9 Modelled concentrations are presented in Table 2 and Table 3 below; the impact descriptors are those provided in the IAQM guidance5 and are based on the change in concentrations as a result of the scheme in 2025. The impacts for nitrogen dioxide, PM_{10} and $PM_{2.5}$ are all negligible, with concentrations of each pollutant being well below the objectives. The effect of the scheme on human health is therefore judged to be 'not significant'.

Table 2: Modelled Nitrogen Dioxide Concentrations at Human Health Receptors

Receptor	Annual Mean Nitrogen Dioxide (µg/m^3)			
	Without Scheme	With Scheme	% Change [a]	Impact Descriptor
H1	19.7	20.5	2	Negligible
H2	21.7	22.6	2	Negligible
H3	15.5	15.9	1	Negligible
H4	14.6	14.8	0	Negligible
H5	24.7	24.9	1	Negligible
H6	20.4	21.3	2	Negligible
Objective	40 µg/m^3		-	

[a] Change as a % of the Environmental Assessment Level (EAL).

[5] Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2

Table 3: Modelled PM_{10} and $PM_{2.5}$ Concentrations at Human Health Receptors

Receptor	Annual Mean PM_{10} (µg/m^3)				Annual Mean $PM_{2.5}$ (µg/m^3)			
	Without Scheme	With Scheme	% Change [a]	Impact Descriptor	Without Scheme	With Scheme	% Change [a]	Impact Descriptor
H1	15.0	15.2	1	Negligible	9.5	9.6	0	Negligible
H2	15.0	15.1	1	Negligible	9.5	9.6	0	Negligible
H3	13.5	13.6	0	Negligible	8.6	8.6	0	Negligible
H4	13.7	13.7	0	Negligible	8.5	8.5	0	Negligible
H5	16.2	16.2	0	Negligible	10.0	10.0	0	Negligible
H6	15.3	15.5	1	Negligible	9.6	9.7	0	Negligible
Objective	**40**		**-**		**20**		**-**	

[a] Change as a % of the Environmental Assessment Level (EAL).

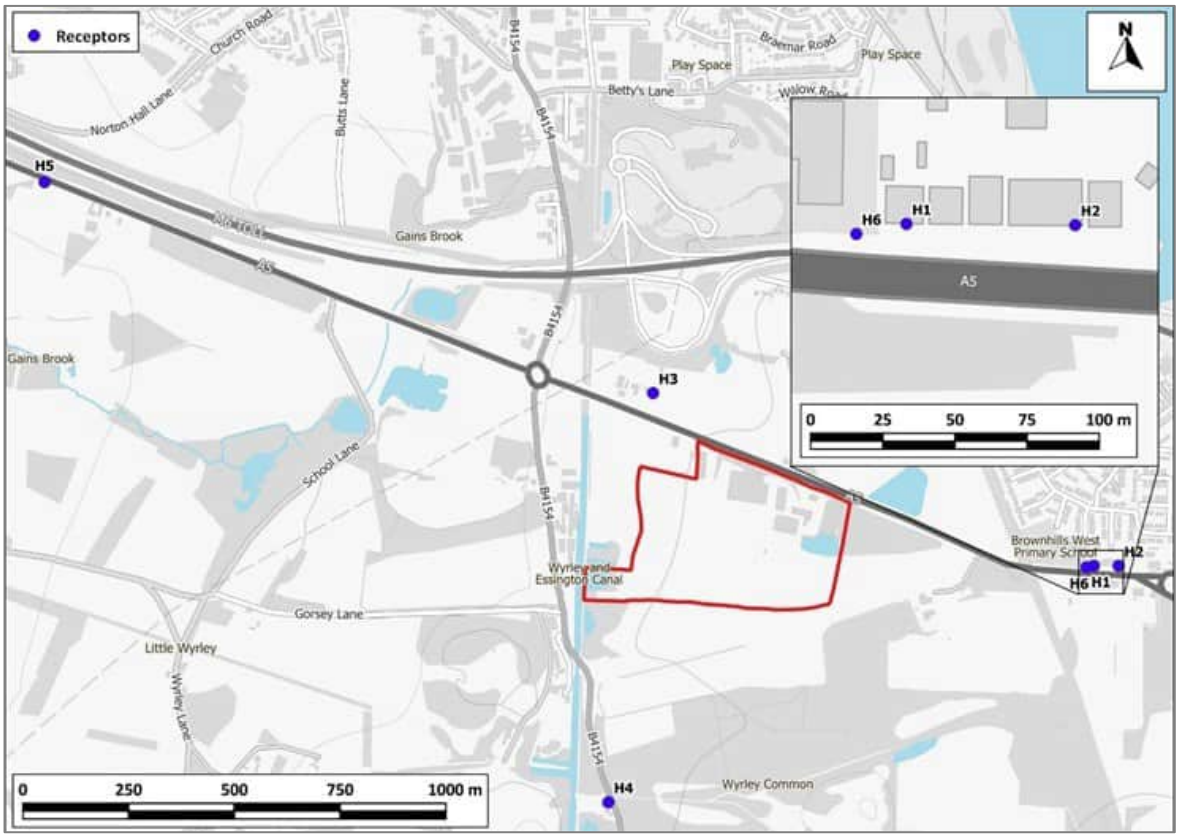

Figure 2: Human Health Receptor Locations

3 Ecology

3.1 The key site of concern is the Cannock Canal Extension SAC. The HRA Scoping Report identifies the qualifying feature as floating water plantain, luronium natans.

3.2 The screening criteria set out by Natural England are, if a plan or project would lead to a change in the Annual Average Daily Traffic (AADT) vehicle flow of more than 1,000 total vehicles or 200 heavy goods vehicles on roads within 200m of the SAC, either alone or in combination, the air quality impacts should be assessed. Site CE20 will exceed these screening criteria in isolation[5].

3.3 As a result, the increase of concentrations of nitrogen oxides and ammonia, and the influence of these changes upon nitrogen deposition (Ndep), have been modelled to establish the impacts of the proposed increase in traffic on the nearby SAC, assuming an opening year of 2025. The impacts have been considered using a two-step approach: **Stage 1** considers the absolute change in concentrations as a result of the scheme, and **Stage 2** considers the in-combination change of the scheme, with generic traffic growth, relative to the future improvement offset. The improvement offset is also referred to as 'autonomous changes' and reflects the reduction in concentrations between the base and future years due to improved emissions standards and uptake of cleaner vehicles. At a different location Natural England have previously considered that a change due to the development in excess of 50% of the autonomous improvements was acceptable[6,7].

3.4 The traffic data provided shows an increase in vehicle traffic near the SAC on both the A5 and Lime Lane; the study area has therefore been restricted to these links.

Stage 1

3.5 In summary, the increase in development traffic is predicted to cause impacts of greater than 1% of the nutrient nitrogen deposition critical load at the nearby SAC, assuming a critical load of 3 kg/ha/yr. This would also be the case if the critical load was designated as 10 kg/ha/yr, although the area of exceedance would be a lot smaller. Figure 3 and Figure 4 below show the increase in modelled nutrient nitrogen deposition at the A5 (Watling Road) and Lime Lane, as a percentage of the 3 kg/ha/yr and 10 kg/ha/yr Critical Load Criteria.

[6] Natural England (2019) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Ashdown Forest Special Area of Conservation (SAC) Site Code: UK0030080.

[7] In this case the development was predicted to remove 53% of the autonomous improvements, while the in-combination impact was predicted to remove 74% of the autonomous improvements. As documented in the executive summary of the air quality modelling report cited by Natural England (2019) which shows the maximum deposition to heath predicted using the most detailed modelling would fall from 22.7 kgN/ha/yr in 2015 to: 19.3 kgN/ha/yr in 2028 without any 'in-combination' traffic; 20.8 kgN/ha/yr in 2028 without the Submission Plan, and 21.8 kgN/ha/yr with the Plan.

3.6 There are also predicted to be impacts greater than 1% of the ammonia critical level of 3 µg/m^3 and NOx critical level of 30 µg/m^3 at the SAC near Lime Lane and the northern tip of the SAC, near the A5. Furthermore, there are predicted to be impacts greater than 10% of the 24-hour NOx critical level of 75 µg/m^3 adjacent to the A5. This would not be the case if the 24-hour NOx critical level was set at 200 µg/m^3. As there is no evidence that concentrations of ozone or sulphur dioxide are high in the area, the 24-hour NOx critical level set at 200 µg/m^3 is judged to be the most appropriate.

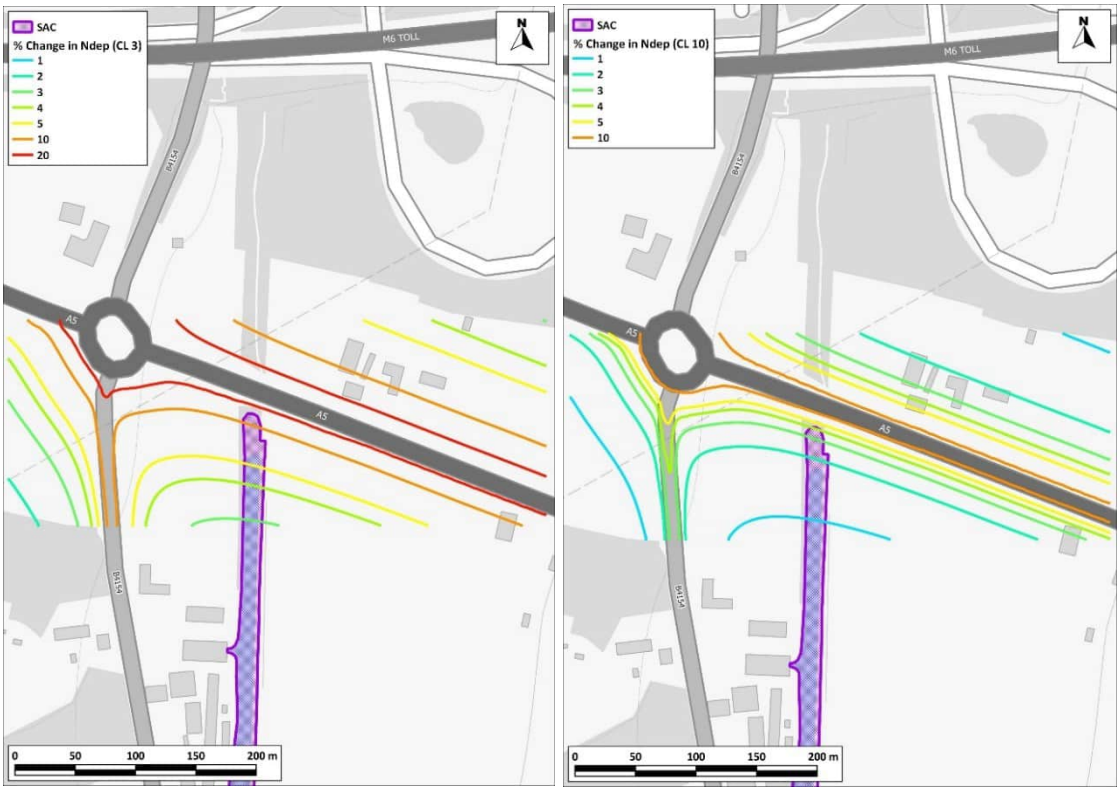

Figure 3: Increase in Modelled Nutrient Nitrogen Deposition at A5 (Watling Road)

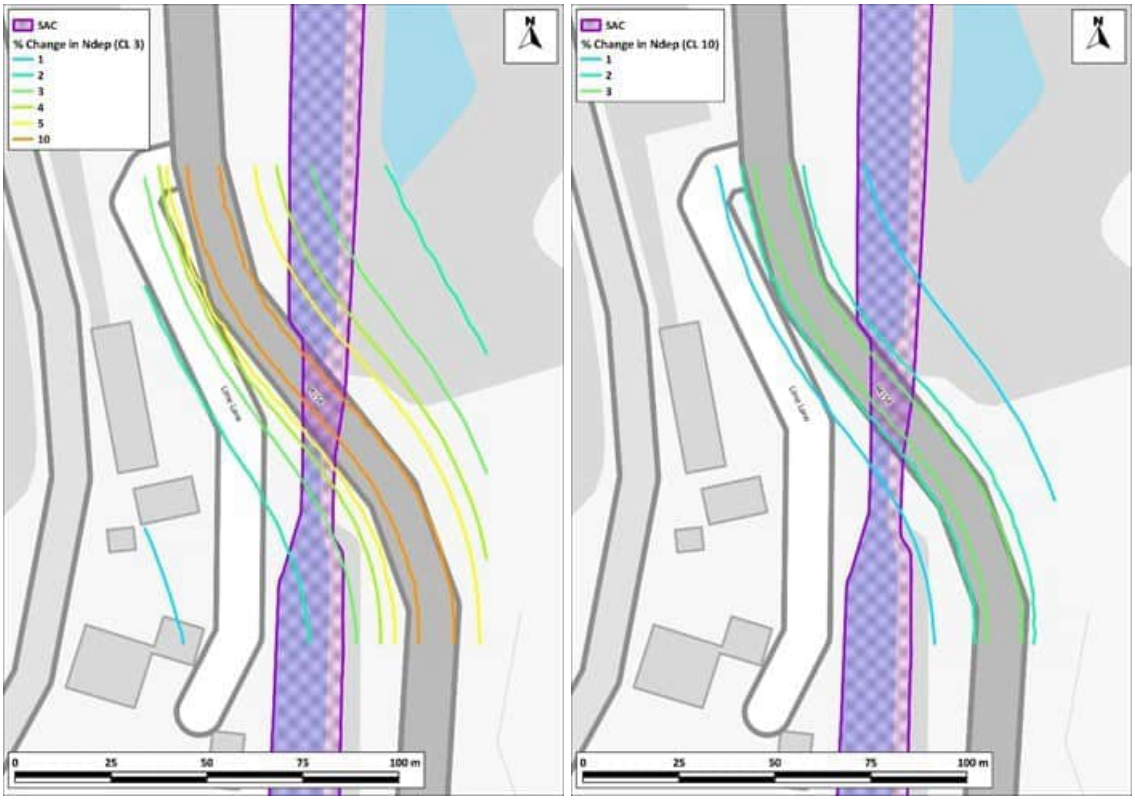

Figure 4: Increase in Modelled Nutrient Nitrogen Deposition at Lime Lane

Stage 2

3.7 Adjacent to the A5, there is small area at the northern tip of the SAC where in-combination changes in modelled nutrient nitrogen deposition are greater than 50% of the autonomous reductions. In addition, a small portion of the SAC directly adjacent to Lime Lane will see an in-combination increase of >50%; this will occur at approximately 70 m^2 of the SAC.

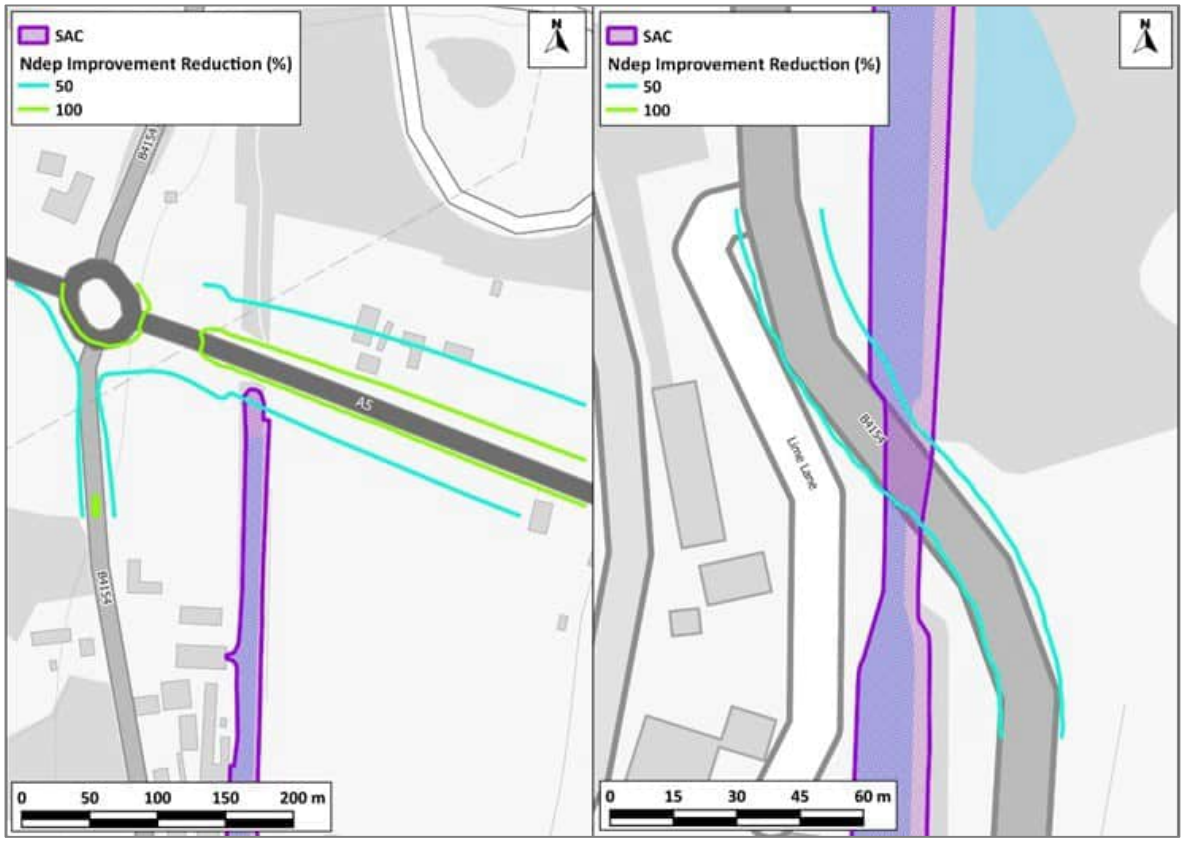

Figure 5: Nutrient Nitrogen Deposition Improvement Reduction (%).

3.8 The combined impact of the Watling Street development and generic traffic growth will not be greater than the future improvement offset at any location within the SAC.

4 Summary

4.1 The development is close to a number of AQMAs; however, this does not mean that the air quality objectives are currently being exceeded along its entire length, nor that this will continue to be the case throughout the lifetime of the plan. Due to the magnitude of traffic predicted to enter the Walsall AQMA, where there are a number of receptors, dispersion modelling of the traffic impacts has been undertaken. The predicted concentrations at worst case receptors do not exceed any of the objectives at any location, and development traffic impacts are predicted to be negligible. The development is, therefore, not expected to have a significant effect at any existing, sensitive receptor with regards to human health.

4.2 Modelled impacts of the development, in-isolation, at the Cannock Canal Extension SAC show an increase greater than 1% of the critical level/load of NOx, NH_3 and nitrogen deposition within areas of the SAC boundary adjacent to both the A5 and Lime Lane.

4.3 The combined impact of the development and generic traffic growth will not be greater than 50% of the future improvement offset, with the exception for nitrogen deposition at a small portion of the SAC. However, the combined impact will not exceed the future improvement offset in any locations within the SAC.

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