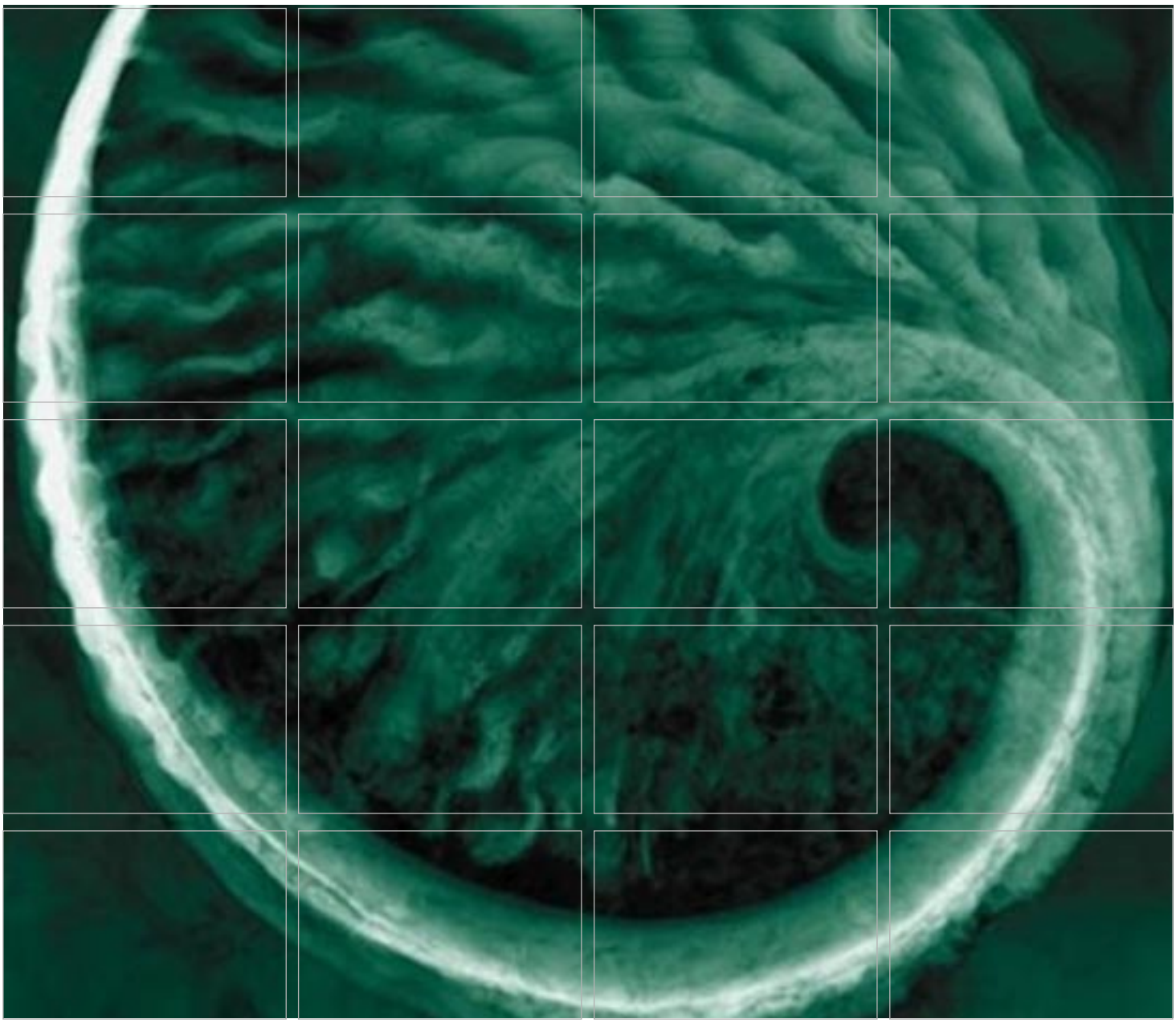

Habitats Regulations Screening Assessment of the Worcestershire Waste Core Strategy

Final Report

August 2009

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Habitats Regulations Screening Assessment of the Worcestershire Waste Core Strategy August 2009

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Final Report

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Date: 28 August 2009

CONTENTS

1 INTRODUCTION

1.1 BACKGROUND

Worcestershire County Council (WCC) submitted a '*Waste Core Strategy: Regulation 28 Submission Document and Proposals Map*' to the Secretary of State in January 2007. Following advice from the planning Inspectorate and in anticipation of emerging government guidance it was clear that it would not be found "sound".

On 21st February 2008, the Secretary of State issued a letter directing the Council to withdraw that document and some of the preparatory work supporting it. WCC subsequently produced a '*Refreshed Issues & Options Consultation*' document in September 2008 which was the first stage in re-commencing work on the Worcestershire Waste Core Strategy (WWCS).

It is the aim of the WWCS to set out a long term Vision for the development of waste management facilities, Objectives to address the issues and a delivery strategy to make it happen. It is not possible for the WWCS to give precise site allocations at this stage; however the WWCS will seek to identify broad locations for waste management facilities. A subsequent Preferred Options document will be produced later in 2009.

Plans and projects which have the potential to affect Natura 2000 sites have to be assessed against the requirements of the Habitat Regulations 1994 (1) (as amended), otherwise known as Habitats Regulations Assessment (HRA). This assessment is now required in the UK due to recent changes in the Habitats Regulations (2). ERM has been commissioned by WCC to undertake a screening assessment of the WWCS under the Habitats Regulations. This assessment is hereafter referred to as a Habitat Regulations Screening Assessment (HRSA).

Given no site allocations are currently proposed, the approach of the HRSA has been to effectively work in reverse. Rather than screening proposed sites or areas for adverse impacts on European sites of nature conservation importance (assumed in this assessment to comprise Natura 2000 (3) and Ramsar sites (4)), this HRSA aims to identify broad areas that would not

(1) The 2007 amendments to the Habitats Regulations formally bring land use planning under the 1994 Regulations (*Regulations 85A-E*) and require a similar consideration of plans.
(2) The 2007 amendments to the Habitats Regulations formally bring land use planning under the 1994 Regulations (Regulation 85A-E) and require a similar consideration of plans.
(3) In May 1992 European Union governments adopted legislation designed to protect the most seriously threatened habitats and species across Europe. This legislation is called the Habitats Directive and complements the Birds Directive adopted in 1979. At theheart of both these Directives is the creation of a network of sites called Natura 2000. The Birds Directive requires the establishment of Special Protection Areas (SPAs) for birds. The Habitats Directive similarly requires Special Areas of Conservation (SACs) to be designated for other species, and for habitats. Together, SPAs and SACs make up the Natura 2000 series. All EU Member States contribute to the network of sites in a Europe-wide partnership from the Canaries to Crete and from Sicily to Finnish Lapland.
(4) Ramsar sites are wetland sites of international importance designated under the Ramsar Convention, signed in Ramsar, Iran, in 1971.

require further consideration of the Habitats Regulations and conversely, areas that would (see *Section 3*).

Areas where no further consideration of the Habitats Regulations is required are fairly limited however further assessment at subsequent planning stages will introduce further areas.

This will help the WWCS to develop an approach whereby the developing and forthcoming policies will be compliant with the requirements of the Habitats Regulations and avoid adverse effects on European sites.

The HRSA is a high level screening assessment to determine whether there are any likely significant effects from the WWCS and associated policies on European sites. This assessment is considered both alone in terms of the waste strategy proposals and in combination with other plans and policies.

Where the identified impacts indicate that likely significant effects will occur on European sites, or where it cannot be concluded that likely significant effects will not occur, then more detailed HRA work, known as Appropriate Assessment (AA), is likely to be required in the future. This further detailed assessment would be used to ensure no adverse effects would arise from future developments of the WWCS on the integrity of European sites. Detailed recommendations for the likely scope of future AA is provided within this report.

1.2 AIM OF THE REPORT

This report presents the findings of the HRSA of the WWCS and determines whether the policies within the Strategy are likely to generate significant effects on European sites, alone or in-combination with other plans or proposals. It also sets out recommendations for further Appropriate Assessment to meet the requirements of the Habitats Regulations.

Specific waste treatment technologies have been considered both as part of the HRSA and for future recommendations of AA. Given the WWCS is currently technology neutral, a range of facility types have been considered and a worst case scenario approach has been adopted as appropriate to allow for uncertainty over parameters such as capacity and likely dimensions.

1.3 REPORT STRUCTURE

The remainder of the report is structured as follows:

- *Chapter 2:* The Habitat Regulations Assessment Process
- *Chapter 3:* Screening Assessment to Determine Likely Significant Effect
- *Chapter 4:* Appropriate Assessment Recommendations
- *Chapter 5:* Glossary of Technical Terms

Additional supporting information is provided in the following:

- *Annex A:* Assessment Tables
- *Annex B:* Consideration of In Combination Effects

- *Map 1*: Study Area and European Sites
- *Maps 2-7:* European Site Buffer Maps
- *Map 8:* HRSA Findings

2 THE HABITAT REGULATIONS ASSESSMENT PROCESS

2.1 THE HABITATS REGULATIONS AND THE CONSENTING PROCESS

In the UK, the European Directive on the *Conservation of Natural Habitats and Wild Flora and Fauna* (*92/43/EEC*) (known as the *Habitats Directive*) has been transposed into national law by means of the *Conservation (Natural Habitats &c) Regulations 1994*, as amended. The need for the Appropriate Assessment of projects arises out of Regulation 48 in that this is a project which satisfies criteria (a) and (b) of Regulation 48 and therefore an Appropriate Assessment will be required.

'Where an operation or activity is being carried out, or is proposed to be carried out, on any land that is not within –
(a) a site placed on a list in accordance with Chapter I of this Part, or
(b) a site where consultation has been initiated in accordance with Article 5 of the Habitats Directive, or
(c) a European site, and is liable to have an adverse effect on the integrity of the site concerned either alone or in combination with other operations or activities the Minister shall ensure that an appropriate assessment of the implications for the site in view of the site's conservation objectives is undertaken.'

Therefore, under the *Habitats Directive,* plans and projects which may affect Natura 2000 sites (*ie* Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and, under British law, Ramsar Sites), either alone or in-combination with other plans or projects, and which are not directly connected with or necessary to the management of the Natura 2000 site, are required to undergo a HRA.

The 2007 amendments to the Habitats Regulations formally bring land use planning under the 1994 Regulations (Regulations 85A-E) and require a similar consideration of plans. Therefore spatial plans or strategies which direct the scale, location and type of development in an area are included under this amendment and their impact on European designated sites should be assessed.

The process is described further in *Section 2.2*.

2.2 THE HABITAT REGULATIONS ASSESSMENT PROCESS

The HRA process is prescribed in Article 6(3) and (4) of the Habitats Directive (*Box 2.1*).

Box 2.1 Habitats Directive (Council Directive 92/43/EEC)

Article 6(3)
'Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public'.

Article 6(4)
'If in spite of a negative assessment of the implications of for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for overriding public interest, including those of a social or economic nature, the member states shall take all compensatory measures necessary to ensure that overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/ or priority species, the only considerations which may be raised are those related to human health or public safety, of beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest'.

European guidance on assessing projects and plans against the requirements of the Habitats Regulations includes a staged process to the assessment (1).

1. Define the proposals.

2. Establish that the proposals are not necessary to the management of the site for nature conservation purposes.

3. Determine whether the proposals are likely to have a significant effect on the site – the approach to this is set out in *Section 2.3*.

4. If proposals are likely to have a significant effect, assess the implications of the proposals for the site's Conservation Objectives so as to answer the question "*can it be demonstrated that the proposal will not adversely affect the integrity of the site?*" This is referred to as the Appropriate Assessment.

5. If the Appropriate Assessment indicates that no adverse effect will occur the competent authority may proceed to grant consent; if not, further steps are required to demonstrate that specific reasons why the development should be permitted apply, before consent may be granted.

2.3 PROCESS OF DETERMINING LIKELY SIGNIFICANT EFFECT (SCREENING)

To determine if the proposals are likely to have any significant effects on the designated sites the following issues are considered:

(1) European Commission Environment Division 2001; *Assessment of plans and projects significantly affecting Natura 2000 sites.*

- could the proposals affect the qualifying interest and are they sensitive to the effect;
- the probability of the effect happening;
- the likely consequences for the site's Conservation Objectives if the effect occurred; and
- the magnitude, duration and reversibility of the effect.

The aim of the Habitats Regulations process is to demonstrate that the proposals will not have an adverse effect on the integrity of the site. Site integrity is defined as:

"the coherence of its 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"[(1)].

The decision on whether the site integrity could be adversely affected by the proposals should focus on and be limited to the site's Conservation Objectives.

European Commission guidance on the screening process recommends that the determination of likely significant should be undertaken in the absence of any mitigation measures [(2)]. This assessment has however, considered mitigation following a recent legal decision in the UK, which has indicated that there is no reason why a screening assessment must be carried out in the absence of any mitigation, and a competent authority should take account of such measures [(3)]. If the competent authority does not agree with the effectiveness of any mitigation and hence cannot conclude no likely significant effect then an AA will be required.

The approached adopted for this screening assessment is listed below.

- A review of the available data on European sites in Worcestershire and a surrounding buffer of 15 km, in order to assemble the following information:
  - the locations of each European site, which are illustrated on *Map 1*;
  - an understanding of the qualifying interest features of the European sites with a focus on the types of habitats and species that they are designated for, the key sensitivities / vulnerabilities of each habitat type / species, and the current condition status of the sites; and
  - Identification and evaluation where possible of potential impacts from various waste technologies on the ecology and nature conservation value of the European sites.

(1) European Communities (2000) Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE. EC.
(2) European Commission Environment DG (2001) *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites.* EC.
(3) Dilly Lane Judgement - Hart District Council v The Secretary of State for Communities and Local Government, Luckmore Limited and Barratt Homes Limited (CO/7623/2007) 1st May 2008.

- An assessment of these findings results in order to link the potential impacts arising the WWCS with any key sensitivities from the habitat type groupings or fauna species that may be significantly affected.

- A review of the regional and local planning and strategy document to identify any parts of plans which have the potential to impact on European sites in combination with the WWCS, taking account of the key sensitivities / vulnerabilities identified from the above review.

- The use of publically available data such as the HRA undertaken for the West Midlands Regional Spatial Strategy and the forthcoming Sustainability Appraisal of the WWCS (ERM 2009).

This information on the Natura 2000 sites has been gathered from data held by the Joint Nature Conservation Committee (JNCC) and Natural England.

Where any Natura 2000 sites are considered to be subject to likely significant effects, further HRA work (or AA) will be needed to determine whether it can be demonstrated that the proposals will not have an adverse effect on the integrity of those European sites.

The findings of the screening assessment are detailed in *Chapter 3*.

3 SCREENING ASSESSMENT TO DETERMINE LIKELY SIGNIFICANT EFFECT

3.1 INTRODUCTION

The scope of this HRSA of the WWCS encompasses all of the European sites in Worcestershire (2 sites) and within a 15 km buffer of the County (3 sites). Walmore Common SPA and Ramsar, located just over the 15 km buffer has also been included within this assessment. In addition, the Severn Estuary Candidate SAC (cSAC), SPA and Ramsar has been considered at the Council's request given the importance of the estuary in a regional context.

As there are no specific development sites, facility types or proposals at this stage a high level filtering approach has been followed looking at likely effects in broad areas alone and in combination with other plans and policies outside the WWCS.

Buffers are used as tools within the assessment to focus likely significant effects of various impacts from waste management facilities. The actual impacts will depend upon the source of the impacts and any links to the designated sites. For example in the case of a thermal treatment facility which is assumed to be a worst case scenario in terms of impacts, the likely significant effects of dry deposition of pollutants is considered for a distance of up to 15 km from the source. This follows Environment Agency Guidance for assessment of Permits under the Habitats Regulations (1).

3.2 IDENTIFIED EUROPEAN SITES (NATURA 2000 AND RAMSAR SITES)

Seven European sites designated for nature conservation value are considered within this assessment. These are listed in *Table 3.1* with a description of their location in relation to Worcestershire County boundary.

Table 3.1 European Sites Considered within the HRSA

European Site	Location in relation to Worcestershire County	Qualifying Feature
Lyppard Grange Ponds SAC (1.09 ha)	Central	Great Crested Newt population.
Bredon Hill SAC (359.86 ha)	South central	Violet Click Beetle
Dixton Wood SAC (13.14 ha)	2 km from the central southern boundary	Violet Click Beetle

(1) Work Instruction: (Appendix 7) – Stage 1 & 2 Assessment of New Integrated Pollution Control (IPC), Pollution Prevention and Control (PPC) Permissions under the Habitats Regulations, Version 6, October 2006, Environment Agency.

European Site	Location in relation to Worcestershire County	Qualifying Feature
Fens Pools SAC (20.4 ha)	7 km from the central northern boundary	Great Crested Newt population
River Wye / Afon Gwy SAC (2234.89 ha)	10 km from western boundary	Habitats: Water courses with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Species: *Austropotamobius pallipes* (White-clawed crayfish) *Petromyzon marinus* (Sea lamprey) *Lampetra planeri* (Brook lamprey) *Lampetra fluviatilis* (River lamprey) *Alosa fallax* (Twaite shad) *Salmo salar* (Atlantic salmon) *Cottus gobio* (Bullhead) *Lutra lutra* (Otter)
Walmore Common SPA (52.85 ha)	15 km from southern boundary	Supports population of - Over winter: *Cygnus columbianus bewickii* (Bewick's swan)
Walmore Common Ramsar (52.85 ha)	As above	International important population of - Over winter: *Cygnus columbianus bewickii* (Bewick's swan)
Severn Esturary cSAC (73,715.4 ha)	20 km from the southern boundary	Habitats: Estuaries Mudflats and sandflats Saltmarsh Species: *Petromyzon marinus* (Sea lamprey) *Lampetra fluviatilis* (River lamprey) *Alosa fallax* (Twaite shad)
Severn Estuary SPA (24,700.01 ha)	As above	Supports populations of - Over winter: *Cygnus columbianus bewickii* (Bewick's swan) On passage: *Charadrius hiaticula* (Ringed plover) Over winter: *Numenius arquata* (Curlew) *Calidris alpina alpina* (Dunlin) *Anas acuta* (Pintail) *Tringa totanus* (Redshank) *Tadorna tadorna* (Shelduck)
Severn Esutary Ramsar (24,662.98 ha)	As above	Regularly supports an assemblage of at least 20,000 waterfowl

It is recognised that designations for some of the sites are based predominantly on species rather than habitats, however supporting habitats are also given due consideration within this assessment, as they underpin the Conservation Objectives.

3.3 *CONSERVATION OBJECTIVES*

Conservation objectives are set by Natural England to ensure that the obligations of the Habitats Directive are met, particularly to ensure that there should be no deterioration or significant disturbance of the qualifying features from their condition at the time the status of the site was formally identified. The conservation objectives are also essential in determining whether the effects of a plan or project are likely to have a significant effect (1).

Table 3.2 Conservation Objectives for the European sites

European Site	Conservation Objectives	Favourable Condition Comment
Lyppard Grange Ponds SAC	To maintain the designated habitats in favourable condition for great crested newts, which is defined in part in relation to a balance of habitat extent (extent attribute). Habitat Types represented (Biodiversity Action Plan categories) Lowland ponds and neutral grassland/ parkland	Favourable
Bredon Hill SAC	To maintain the presence of dead ash wood and pollards for *Limoniscus violaceus* (Violet click beetle). The Conservation Objectives (COs) for Bredon Hill SAC are focussed on the component Site of Special Scientific Interest (SSSI): Bredon Hill. The COs for the European interest on the SSSI are: to maintain*, in favourable condition, the: broadleaved, mixed and yew woodland; and lowland parkland and wood pasture.	Favourable
Dixton Wood SAC	To maintain the presence of dead ash wood and pollards for *Limoniscus violaceus* (Violet click beetle). The Conservation Objectives (COs) for Bredon Hill SAC are focussed on the component Site of Special Scientific Interest (SSSI): Bredon Hill. The COs for the European interest on the SSSI are: to maintain*, in favourable condition, the: broadleaved, mixed and yew woodland; and lowland parkland and wood pasture.	Favourable

(1) Article 6.2 of the Habitats Directive.

European Site	Conservation Objectives	Favourable Condition Comment
Fens Pools SAC	To maintain the extent of the amphibian habitat (terrestrial and aquatics). No loss of area or fragmentation of site (through significant barriers to amphibian dispersal) compared with status at designation.	Favourable
River Wye / Afon Gwy SAC	The Conservation Objectives for the River Wye SAC are focussed on the component SSSIs: • River Lugg • Lower Wye The COs for the European interest on the SSSIs are to maintain, in favourable condition, the: • floating formations of water crowfoot (*Ranunculus*) of plain and sub-mountainous rivers and populations of: • atlantic salmon (*Salmo salar*) • allis shad (*Alosa alosa*) • twaite shad (*Alosa fallax*) • bullhead (*Cottus gobio*) • brook lamprey (*Lampetra planeri*) • river lamprey (*Lampetra fluviatilis*) • sea lamprey (*Petromyzon marinus*) • white-clawed crayfish (*Austropotamobius pallipes*) and the river and adjoining land as habitat for populations of • otter (*Lutra lutra*)	Favourable
Walmore Common SPA	Bewick's Swan • no significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline • significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure; • relevant attribute: disturbance in feeding or roosting areas; • measure: reduction or displacement of wintering birds.	Favourable
Walmore Common Ramsar	Internationally important bird assemblage • no significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline. • maintain no less than 43 individuals, representing an average of 0.5% of the GB population (i.e.the 5 year peak mean 1998/9- 2002/3)	Favourable
Severn Esturary cSAC	The COs for the European interest are to maintain, in favourable condition, the: • estuaries • mudflats and sandflats not covered by seawater at low tide • atlantic salt meadows	Favourable
Severn	Bewick's Swan	Favourable

European Site	Conservation Objectives	Favourable Condition Comment
Estuary SPA	• no significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline • significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure; • relevant attribute: disturbance in feeding or roosting areas; • measure: reduction or displacement of wintering birds. "Supporting habitats" are identified which describe the key habitats within the European marine site necessary to support the interest features i.e. the qualifying bird species. The "favourable condition table" contains further detail on habitat conditions. • subject to natural change, maintain in favourable condition the habitats for the internationally important populations of the Annex 1 and migratory species • intertidal mudflats and sandflats (Annex 1 species, migratory species and waterfowl assemblages); • saltmarsh communities (Annex 1 species, migratory species and waterfowl assemblages); and • shingle and rocky shore (migratory species and waterfowl assemblages).	
Severn Estuary Ramsar	No less than 68,026 individuals in the assemblage (i.e. the 5 year peak mean between 1988/9 – 1992/3). • Relevant attribute which may cause deterioration: Non-physical disturbance, noise (eg coastal development; Visual (coastal development). Non-toxic contamination: changes in nutrient loading and changes in organic loading (industrial outfalls). • No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline. Target number of Annex II species: • Dunlin - >41,683; Shelduck>2,892; Redshank>2,013; (i.e. the 5 year peak mean between 1988/9 – 1992/3). Maintain in a favourable condition the habitats for the internationally important assemblages of waterfowl listed in *Box 6.1*, in particular: • saltmarsh - Upper and lower saltmarsh provide important feeding and roosting areas. The European white-fronted geese graze on a range of saltmarsh grasses and herbs. The birds feed on the saltmarsh and the transition to coastal grazing marsh in front of the sea defences in the upper estuary. • mudflats and sandflats; and • coastal lagoons.	Favourable

3.4 KEY SITE SENSITIVITIES

The key site sensitivities for each habitat type were established by reviewing information provided within the conservation objectives for each site and identifying the main sensitivities / vulnerabilities for each habitat or species.

The key sensitivities of the habitat types associated with each group of European sites are listed in *Table 3.1*. Where sites are primarily designated for their faunal interest, they have been included in the category which best represents the habitat type used by the species in question, but it is recognised that these species will also utilise other habitat types.

Table 3.3 Key European Site Sensitivities

Habitat Type and Species Associated European Site	Key Sensitivities Represented Across the European sites by habitat type (assuming no direct habitat loss)
Ponds and Pools	
• Lyppard Grange Ponds SAC – Great Crested Newt • Fen Pools SAC – Great Crested Newt	Water quality - eutrophication is a threat, particularly from point source pollution (e.g. sewage outfalls) but also from surface run-off or groundwater pollution and atmospheric deposition Water levels – a high and stable water table is fundamental. Siltation (eg excessive poaching of lake margins by stock, suspended sediments leading to transport of nutrients) Scrub or tree encroachment (leading to shading, nutrient and hydrological effects) Maintenance of appropriate grazing regime Spread of introduced non-native species Recreational pressure / disturbance (particularly on-water activities with potential to disturb sediment and increase turbidity in lakes) Development pressure Diffuse air pollution from traffic and agriculture.
Woodland	
• Bredon Hill SAC • Dixton Wood SAC	Water quality – e.g. pollution through groundwater and surface run-off sources Water level – maintenance of water table essential e.g. restrict new drainage ditches around wet woodlands Maintenance of appropriate grazing regime Heavy recreational pressure Spread of non-native / invasive species Scrub encroachment Atmospheric pollution (nutrient deposition and acidification)

Habitat Type and Species Associated European Site	Key Sensitivities Represented Across the European sites by habitat type (assuming no direct habitat loss)
	Development pressure
Rivers	
• River Wye / Afon Gwy SAC • Severn Estuary cSAC	Water quality – pollution through agricultural run-off and sewage outputs is a problem Flow (flow regime should be characteristic of the river). Abstraction should be regulated. Suspended sediments/siltation – through intensification of agricultural practices and other disturbance eg soil degradation around stock feeding points Inappropriate dredging Recreational pressure and disturbance – can lead to disturbance, damage and increases in suspended sediment eg footpath erosion, water-based activities Atmospheric pollution - deposition of oxides of nitrogen & sulphur, acidification of river water (deposition of nitrogen & ammonia) Climate change - change in rainfall patterns and transpiration rates, inc temp – more algal blooms, reduced summer flow. Inc high rainfall – more erosive runoff and sedimentation Illegal fish poaching Spread of introduced non-native species Artificial barriers to fish migration
Wet Grassland	
• Walmore Common SPA and Ramsar	Maintenance of appropriate grazing regime Water level – maintenance of hydrological regime (grassland communities are strongly influenced by the quantity and base status of the groundwater) Water quality – nutrient enrichment from fertiliser run-off etc Scrub encroachment (often due to undergrazing) Development pressure Spread of introduced non-native species Human disturbance (off-road vehicles, burning (vandalism)) Atmospheric pollution eg nitrous oxides from vehicle exhausts.
Estuarine Habitats	
• Severn Esturary cSAC/SPA/Ramsar	Water quality – pollution Recreational/tourism disturbance

Habitat Type and Species Associated European Site	Key Sensitivities Represented Across the European sites by habitat type (assuming no direct habitat loss)
	Development eg dock/harbour creation, coastal defence works
	Erosion
	Siltation
	Dredging
	Over-fishing
	Maintenance of appropriate grazing regime
	Spread of non-native species
	Disturbance to bird feeding and roosting habitat (noise / visual)

3.5 *KEY IMPACTS*

Table A1.1, Annex A and associated explanatory notes adapted from the Environment Agency's Work Instruction Appendix 6 (1) the Waste Management Sensitivity Matrix (2) was used to identify the key impacts likely to affect the integrity of the qualifying features of the European sites. The table was used to identify the key hazards affecting the likely sensitivities of qualifying features and supporting habitats to the listed typical hazards arising from waste management facilities.

3.6 *SCREENING ASSESSMENT*

Worcestershire County Council's local waste management target is to maximise the diversion of waste away from landfill through prevention and reuse but also through recycling/composting and recovery. Whilst recovery from thermal treatment facilities will only comprise a small part of waste management, incineration facilities have the potential to impact on European sites especially EfW (Energy from Waste) plants which can have wide ranging effects as air emissions disperse (see *Table 3.4)* and therefore will require consideration.

Table 3.4 provides a general description of the waste facilities of relevance for the WWCS, and lists the potential impacts which might result from their use. A comparison of these potential impacts with the known sensitivities / vulnerabilities of the European sites listed in *Table 3.1* shows that such facilities have the potential to affect European sites.

(1) Work Instruction: (Appendix 7) – Stage 1 & 2 Assessment of New Integrated Pollution Control (IPC), Pollution Prevention and Control (PPC) Permissions under the Habitats Regulations, Version 6, October 2006, Environment Agency, Work Instruction (Appendix 6). Further Guidance applying the Habitats Regulations to Waste Management Facilities.
(2) 'New Integrated Pollution Control (IPC), Pollution Prevention and Control (PPC) Permissions under the Habitats Regulations', Work Instruction Appendix 6 ( ) the Waste Management Sensitivity Matrix, Environment Agency, 2007.

The main impacts to European sites that may arise as a result of these facilities include air emissions, water pollution and traffic emissions, although general disturbance impacts may have an effect if the protected habitats or species of a European site are sensitive to light, noise or human disturbance such as great crested newt at Lyypard Grange Ponds and Fen Pools and wintering populations of Bewick's Swan at Walmore Common (though the physical distance from the County boundary makes this unlikely.

General disturbance impacts can usually be readily controlled, however, depending on the location of a development, air emissions are harder to control or reduce to acceptable levels, especially where the receiving habitat is both sensitive and already subject to high loads. For example Lyppard Grange Ponds has the possibility of effects from raised nutrient nitrogen levels which have the potential to affect the abundance of algae and macrophytes thereby affecting the water quality and impacting on the population of great crested newts, particularly as nutrient nitrogen critical loads for the site are already in exceedance. It is possible that some of the contributions to the nitrogen loads also arise from areas outwith Worcestershire. An EfW plant will produce air emissions from the stack and from traffic and will add to the nitrogen load, this would therefore require further investigation through air dispersion modelling.

Table 3.4 Generic Waste Facility Descriptions

Facility	Description (1)	Potential Impacts
Thermal Treatment Facility and Advanced Thermal Treatment (ATT)	Waste management processes involving medium and high temperatures to recover energy from the waste. ATT includes pyrolysis and gasification based processes.	Air pollution from stack and traffic emissions, aquatic impacts due to hydraulic connections, general disturbance impacts (land take, noise, light, human presence, litter, bird disturbance and increased presence of predators).
Materials Recycling Facility/ Material Recovery Facility (MRF)	Dedicated facility for the sorting / separation of recyclable materials.	Traffic emissions, general disturbance impacts.
Waste Transfer Station	A facility to which waste is taken for onward transfer for treatment, recycling or landfill elsewhere.	Traffic emissions, general disturbance impacts.

(1) Taken from Mechanical Biological Treatment of Municipal Solid Waste, Defra 2007 and Advanced Thermal Treatment of Municipal Solid Waste, Defra 2007.

Facility	Description [1]	Potential Impacts
Open Windrow Composting	Green waste is shredded and left in the open to mature. It is turned regularly. The compost can be used on land subject to appropriate controls.	Traffic emissions, general disturbance impacts, bioaerosols within 250m and aquatic pollution from run-off.
In Vessel Composting	The aerobic decomposition of shredded and mixed organic waste within an enclosed container, where the control systems for material degradation are fully automated. Moisture, temperature, and odour can be regulated, and stable compost can be produced much more quickly than open windrow composting. The compost can be used on land subject to appropriate controls.	Traffic emissions, general disturbance impacts, and aquatic pollution from run-off.
Anaerobic Digestion	The anaerobic decomposition of shredded and mixed organic waste within an enclosed container, where the control systems for material degradation are fully automated. Moisture, temperature, and odour can be regulated, and stable compost can be produced much more quickly than open windrow composting. Energy may be generated. The compost can be used on land subject to appropriate controls.	Traffic emissions, general disturbance impacts, and aquatic pollution from run-off.

Whether significant effects are likely to occur on European sites will be dependent on a number of factors including:

- the location of any waste management facility including any associated ancillary facilities or induced developments (especially in the case of EfW) Plants) relative to the designated sites;
- the type and magnitude of emissions from that facility, which may be heavily influenced by the technology (*eg* for EfW plants);
- whether the designated site is sensitive to the impacts which result from the facility; and
- the mitigation which could be put in place to avoid or reduce the effects of the impacts and which would be developed as part of the detailed permissions for any particular development to allow the plant to comply with the requirements of international and national legislation and best practice.

The initial assessment has shown that only limited areas remain that are outside the 15 km buffer of European sites where it can be concluded that no likely significant effects are expected (*Map 8*).

The appraisal tables in *Annex A* present the findings of the screening assessment for each European site at this stage. The WWCS does not contain enough spatial information or details about proposed plant to establish

whether significant effects will occur or are likely to occur at any of the European sites. Such detail will be included as part of progression of the Preferred Options.

3.7 CONSIDERATION OF IN COMBINATION EFFECTS

Likely significant effects have been identified which could arise from proposed development through implementation of the WWCS (see *Section 3.8*). It is also necessary to consider in combination effects which could arise through other plans and policies active across Worcestershire and also in neighbouring counties. This will again help to identify broad areas which could prove to be more or less of a concern in relation to adverse impacts on European sites. For example, key growth areas arising from the regions housing strategies will put some areas under additional pressure from disturbance and traffic pollution and this may further increase the chances of likely significant effects from the development of waste facilities in such locations.

Table B1 in *Annex B* identifies key plans and policies and associated broad locations within Worcestershire which are considered to pose potential additional pressures on European sites and should therefore be considered through the spatial development of Preferred Options. The HRSA has identified issues in other plans and projects which could affect some of the European sites, further account will need to be taken at the next stage. Finally when the WWCS is shown not to have likely significant effects on European sites, a final consideration of other plans and projects will be required to ensure they do not effect the conclusions.

3.8 CONCLUSION

It is evident from reviewing the WWCS that the implementation of the WWCS could result in the development of a range of waste and associated facilities which may affect European sites. Hence it is not possible to conclude no likely significant effect and an Appropriate Assessment is required for some of the European sites. A summary of the conclusions of the HRSA is provided in *Table 3.5* below. *Map 8* indicates the areas where no likely significant effects are concluded due to the sites being over 15 km from

Table 3.5 Conclusion of HRSA

European site	Can it be concluded at this stage that there will be no likely significant effects on the European site as a result of the HRSA?	Effects requiring further appropriate assessment	Is further consideration of in-combination effects required?
Lyppard Grange Ponds	No	• Air pollution effects from	• Yes - Disturbance effects from

European site	Can it be concluded at this stage that there will be no likely significant effects on the European site as a result of the HRSA?	Effects requiring further appropriate assessment	Is further consideration of in-combination effects required?
SAC		thermal treatment stack emissions; and • Air pollution effects from traffic; and • Effects from hydrological links.	potential increase in human presence; • Traffic pollution
Bredon Hill SAC	No	• Air pollution effects from thermal treatment stack emissions; and • Air pollution effects from traffic.	• Yes - Disturbance effects from potential increase in human presence;
Dixton Wood SAC	No	• Air pollution effects from thermal treatment stack emissions; and • Air pollution effects from traffic.	• Yes - Disturbance effects from potential increase in human presence;
Fens Pools SAC	No	• Air pollution effects from thermal treatment stack emissions.	No
River Wye / Afon Gwy SAC	No	• Air pollution effects from thermal treatment stack emissions.	No
Walmore Common SPA and Ramsar	No	• Air pollution effects from thermal treatment stack emissions.	No
Severn Esturary cSAC, SPA and Ramsar	Yes	None	No

The findings of the HRSA are that it is not possible to conclude that there will be no likely significant effect on European sites from the WWCS, alone or in-combination with other projects or plans, and that an Appropriate Assessment is required to progress the spatial development of Preferred Options. This is predominantly due to the necessarily high level nature of the Strategy, and particularly the absence of any spatial detail.

Despite this it is entirely possible that the approach set out in the WWCS and the facilities to be promoted within it can be developed in a manner which will not result in effects on the integrity of European sites given that the HRSA has been undertaken at an early stage and can therefore influence Spatial Options.

An important part of the development of the Preferred Options will be close consultation with organisations including Natural England, the Environment Agency and surrounding local authorities. If necessary, the wording of relevant policies will reflect the need to maintain the integrity of the European sites, and that development will not be permitted unless this is achieved, or other requirements of the *Habitat Regulations* which do allow development are met (*eg* Imperative Reasons of Overriding Public Interest (IROPI)). Avoidance of impacts to Natura 2000 sites will be the prime focus, with emphasis on mitigation if for any reason avoidance is demonstrated not to be possible.

Specific issues which will be addressed through further assessment include those listed below.

- The consideration of in combination effects concluded that further consideration of other plans and projects will be required for the spatial options within the development of the WWCS. These in combination considerations are summarised in *Table 3.5*.

- Avoidance of impacts will be a prime focus and careful consideration will be given to the location of the waste and ancillary facilities (especially EfW plants), or any induced development, relative to the designated sites. Indicative locations which are considered suitable for the waste facilities (*ie* they avoid effects on integrity of the European sites) should be identified. This will take account the source locations of the waste and the need to reduce travel for collection and disposal. For EfW plants air quality modelling of a generic facility should be used to allow the suitability of identified sites to be investigated. Appropriate locations will vary between the waste facility types, and it is envisaged that buffer zones will be agreed with Natural England to give appropriate protection to the qualifying interests of the designated sites.

- Some of the European sites support habitats where current nitrogen deposition is already exceeding the critical loads, and where there are concerns about the effects of additional loads. The Preferred Options will need to agree an approach with Natural England for the allocation of waste sites where likely significant effects are shown due to elevated critical loads. This will take account of the latest guidance on acceptable critical load thresholds and appropriate levels of abatement.

- The actual locations of the sensitive habitats / species within the European sites can be considered as appropriate. For example, initial assessments of the effects of air emissions based on an assessment of impacts at the European site boundary, may not reflect the likely impact on the sensitive interest if it lies some distance beyond that. Where any effects to sensitive features are likely, the decision about acceptability will take account of the percentage of the sensitive feature which is affected and the significance of that effect in agreement with Natural England.

- Similarly in determining whether a particular waste facility at a location is acceptable, advances in technology and the effectiveness of available mitigation options will also be considered. For example if modelling of the effects of emissions from an EfW plant at a location produced levels above but close to the Environment Agency defined thresholds of insignificance (*eg* 1% of critical load / level), then it does not necessarily mean that a plant will be unacceptable once a detailed site proposal arises. A project application could include appropriate levels of mitigation to reduce the emissions to acceptable levels. Natural England and the Environment Agency are currently seeking to improve the understanding of the effects of levels greater than 1%, and the WWCS should take account of the latest findings of their work. Consideration should also be given to likely changes to baseline air quality associated with other strategies / plans, for example transport strategies which will reduce vehicles emissions.

- The WWCS will define the facility requirements for Worcestershire. It will also provide guidance on the size of facilities and hence the numbers which are likely to be acceptable to meet that need, taking into account any imported and exported waste volumes and where they occur.

- It is also possible that over the life of the WWCS that advances in technology will occur that will also allow the development to occur, or new technologies become proven at a larger scale (*eg* gasification and pyrolysis). This should be undertaken in consultation and agreement with Natural England and the Environment Agency, and any detailed proposals would themselves also be subject to a HRA at a later stage.

The HRSA of this WWCS has not been able to conclude no likely significant effect, with the exception of the Severn Estuary, but has acknowledged that the approach set out in the WWCS can be implemented without affecting the integrity of European sites through further Appropriate Assessment as part of development of the spatial options for site allocations. Appropriate Assessment will include consultation with Natural England, the Environment Agency and local authorities.

Term	Definition
Anaerobic Digestion	The anaerobic decomposition of shredded and mixed organic waste within an enclosed container, where the control systems for material degradation are fully automated. Moisture, temperature, and odour can be regulated, and stable compost can be produced much more quickly than open windrow composting. Energy may be generated.
Annex 1	European protection applied to bird species listed in Annex 1 of the European Birds Directive.
AA	An Appropriate Assessment (AA) is a requirement of the European Habitats Directive. It is an assessment used to determine whether a plan or project will adversely affect the integrity of an internationally designated nature conservation site. The decision on whether the site integrity could be adversely affected by the proposals should focus on the site's Conservation Objectives (normally defined for each SSSI underpinning the Natura 2000 site).
Conservation Objectives	Every SSSI has a set of Conservation Objectives which define the desired state for each site in terms of the features for which they have been designated. When these features are being managed in a way which maintains their nature conservation value, then they are said to be in 'favourable condition'.
EfW	Energy from Waste (facility)
Eutrophication	Eutrophication is a process where the environment receives excess nutrients (eg nitrogen or phosphorus), and may occur on land or in water. Eutrophication leads to an excessive increase in plant growth and decay which has adverse effects on the ecosystem. For example, eutrophication in a lake may lead to an algal bloom and associate effects including a severe reduction in oxygen levels and water quality and adverse effects on fish and other fauna..
Gasification	A thermal treatment that operates at a higher temperature range than pyrolysis, typically above 650◦C. Air or oxygen is used to partially combust the waste to achieve higher temperatures. Water is added to the Gasifier to produce hydrogen and oxygen. The oxygen reacts with carbon in the waste material. A high concentration of hydrogen is in the gas produced by gasification, which differentiates the process from pyrolysis.
Habitats Directive	The European Directive on the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC)
HRA	Habitat Regulations Assessment
HRSA	Habitat Regulations Screening Assessment
IROPI	Imperative Reasons of Overriding Public Interest
In Vessel Composting	A type of waste facility where the aerobic decomposition of shredded and mixed organic waste is undertaken within an enclosed container, where the control systems for material degradation are fully automated. Moisture, temperature, and odour can be regulated, and stable compost can be produced much more quickly than open windrow composting.
JNCC	The Joint Nature Conservation Committee
Materials Recycling Facility/ Material Recovery Facility (MRF)	Dedicated facility for the sorting / separation of recyclable materials.

Term	Definition
Natura 2000 sites	A network of European protected sites comprising SACs and SPAs
Pyrolysis	A medium temperature thermal process where organic materials in waste are broken down under the action of heat and in the absence of oxygen. Only carbon-based materials can by pyrolysed. Pyrolysis is similar to the process which produces charcoal.
Ramsar	A site designated under the Ramsar Convention as being a Wetland of International Importance.
SAC	A Special Area of Conservation (SAC) is a site designated under the *Habitats Directive* to protect sites that are considered rare because of their habitats or the species contained within them. A cSAC is a candidate SAC.
SPA	A Special Protection Area (SPA) is a site designated under the *Birds Directive* to protect sites that are considered rare because of their internationally important populations of bird species.
SSSI	A Site of Special Scientific Interest is a nationally protected site in the UK, providing statutory protection for the country's best wildlife and geological sites.
Thermal Treatment Facility and Advanced Thermal Treatment (ATT)	Waste management facility where processes involve using medium and high temperatures to recover energy from the waste. ATT includes pyrolysis and gasification based processes.
Waste Transfer Station	A facility to which waste is taken for onward transfer for treatment, recycling or landfill elsewhere.
WCC	Worcestershire County Council
WWCS	Worcestershire Waste Core Strategy

Annex A

Assessment Tables

A1 ANNEX A – ASSESSMENT TABLES

A1.1 WASTE SENSITIVITY MATRIX SUMMARY

Table A1.1 is adapted from 'New Integrated Pollution Control (IPC), Pollution Prevention and Control (PPC) Permissions under the Habitats Regulations', Work Instruction Appendix 6 (1) the Waste Management Sensitivity Matrix, Environment Agency, 2007. The table indicates key impacts likely to affect the integrity of the qualifying features of the European sites. The table has been used to identify the key hazards provides guidance on the likely sensitivities of qualifying habitats to the listed typical hazards arising from waste management facilities. This table was then used within the following screening assessment tables (Tables A1-A3).

Table A 1.1 Summary Sensitivity Matrix

	Lyypard Grange Ponds	**Bredon Hill**	**Dixton Wood**	**Fens Pools**	**Walmore Common**	**River Wye SAC**			**Severn Estuary cSAC, SPA, Ramsar**		
Hazard (and the emissions or activities which may give rise to the hazard)	Amphibia	Invertebrates of wooded habitats	Invertebrates of wooded habitats	Amphibia	Birds of estuarine habitats	Riverine habitats	Mammals of riverine habitats	Non-migratory fish & invertebrates of	Anadromous fish	Birds of estuarine habitats	Anadromous fish	Estuarine & intertidal habitats

(1) Work Instruction: (Appendix 7) – Stage 1 & 2 Assessment of New Integrated Pollution Control (IPC), Pollution Prevention and Control (PPC) Permissions under the Habitats Regulations, Version 6, October 2006, Environment Agency, Work Instruction (Appendix 6). Further Guidance applying the Habitats Regulations to Waste Management Facilities.

Toxic contamination (Leach, LFG, LFG flare, SW, dust)	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nutrient enrichment (Leach, SW, dust)	✓	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓
Habitat loss (SW, Access)	✓	✓	✓	✓	✓	X	✓	✓	X	✓	X	✓
Siltation (SW)	✓	X	X	✓	✓	✓	✓	✓	✓	X	✓	X
Smothering (Dust, Litter)	✓	✓	✓	✓	✓	X	X	✓	X	✓	X	✓
Disturbance (Access, Noise, Gulls)	✓	X	X	✓	✓	X	✓	X	X	✓	X	X
Predation (Gulls)	X	X	X	X	✓	X	X	X	X	✓	X	X

Key to hazards; Leach = leachate, LFG = Landfill gas, LFG Flare = landfill gas flares or engines, SW = surface water discharges, dust = dust / particulate emissions, Access = physical access, Litter = windborne debris, Noise = noise emissions, Gulls = gulls, corvids, rats & other predatory vermin. '3' indicates that at least one of the features in the group is potentially sensitive to the hazard, and the likely exposure of the interest feature to the hazard should be addressed.

A1.1.1 Notes to Table A1.1:

The matrix is not comprehensive and is based on the judgement of staff in the Agency, EN and CCW and ERM. There may be other hazards and sensitivities, which will vary according to circumstances.

✓ indicates that at least one of the features in the group is potentially sensitive to the hazard, and the likely exposure of the interest feature to the hazard should be assessed. This should be an exploration of the hazard – pathway- receptor links.

A1.1.2 Matching 'Hazards' to emissions & activities at waste management facilities

Toxic Contamination

Emissions from waste activities that could be toxic or harmful to the flora and fauna of the European sites. Effects may be direct (e.g. landfill gas migration leading to vegetation distress) or indirect (such as heavy metal take-up by vegetation grazed by swans).
Risks from – Landfill gas, landfill gas flare emissions, leachate, surface water, dust.

Nutrient enrichment

An addition of nutrients can lead to changes in vegetation, directly affecting protected habitats and species of flora, or protected species dependant upon the vegetation.
Risks from – Surface water, leachate, dust.

Habitat loss or physical damage

Physical damage caused by access or erosion.
Risks from – Surface water, Physical access (litter collection, environmental monitoring, emergency access and remedial schemes).

Siltation

Physical damage caused by the deposit of suspended solids from water.
Risks from – Surface water.

Smothering

Physical damage caused by the deposit of solid material from the air.
Risks from – Dust, litter.

Disturbance

Disturbance causes birds/mammals to deviate from their normal, preferred behaviour.
Risks from – Noise, Gulls & corvids (inc. bird scaring techniques), Physical access (litter collection, environmental monitoring, emergency access / remediation).

Predation

Pests and vermin attracted to the landfill may prey upon protected species, particularly the eggs and young of nesting birds.
Risks from – Gulls, corvids, rats.

Table 1.1 Quick Reference for Table A1.1

Hazard	Landfill gas	Landfill gas flare emissions	Leachate	Surface water	Dust	Litter	Physical access	Noise and visual intrusion	Gulls, corvids, rats
Toxic contamination	✓	✓	✓	✓	✓				
Nutrient enrichment			✓	✓	✓				
Habitat loss				✓			✓		
Siltation				✓					
Smothering					✓	✓			
Disturbance							✓	✓	✓
Predation									✓

A1.2 SCREENING APPRAISAL TABLES

Table A1.2 Screening Appraisal of the Implications of the WWCS on Lyppard Grange Ponds SAC

LYPPARD GRANGE PONDS SAC

SITE DESCRIPTION

1 Brief description of European site

Lyppard Grange Ponds Special Area of Conservation (SAC) is situated in the eastern suburbs of Worcester in the county of Worcestershire. Lyppard Grange Ponds (1.09 ha) is set amongst a recent housing development, formerly pastoral farmland. The area contained a number of large ponds in the past, which were maintained for agricultural purposes. The current ponds are considered a good-quality terrestrial habitat, which contain *Triturus cristatus* (Great crested newt). The site is predominantly composed of improved grassland as well as heath/scrub/maquis and garrigue/phygrana and inland water bodies.

The site is primarily designated for supporting the *Annex II* species, *Triturus cristatus* (Great crested newt).

Qualifying Interests for which the site is designated:
Annex II Species:

SCIENTIFIC NAME	COMMON NAME / DESCRIPTION
Triturus cristatus	The Great crested newt is Britain's largest newt species. They have dark grey-brown backs and flanks with darker coloured spots and fine white spots on their lower flanks. The undersides are either yellow or orange coloured. Their habitat for most of the year is weedy ponds and small lakes.

Description of qualifying species importance and vulnerability

The site is considered one of the best areas in the UK for supporting populations of *Triturus cristatus*.

The main threat to *Triturus cristatus* is the surrounding area of the site. Residential development may create recreational pressure from the public, in particular, the introduction of fish, which affect the breeding habitat for great crested newts. A high number of sticklebacks in one of the ponds is affecting the long-term survival of newt populations at the current level.

2 Conservation objectives for the European site

The Conservation Objectives (COs) for Lyppard Grange Ponds SAC are focussed on the component Site of Special Scientific Interest (SSSI): Lyppard Grange Ponds.

The COs for the European interest on the SSSI are:

to maintain*, in favourable condition, the:
Open water eutrophic small ponds and parkland/scattered trees and outstanding population of *Triturus cristatus*.

*maintenance implies restoration if the feature is not currently in favourable condition.

The Favourable Condition Table for Lyppard Grange Ponds SSSI is used to determine if the site is in favourable condition, and can be used, in combination with issues specific to the project, to inform the scope and nature of any Appropriate Assessment (AA) under the Habitat Regulations.

The attributes of the qualifying species within the SAC and the measures and targets for their conservation are summarised below.

***Triturus cristatus* (Great crested newt):**

Attribute	Measure	Target	Comments
1. Eggs	Record presence during one day or night visit between mid-March and mid-May. Survey for 4 consecutive years within each 6 year reporting cycle.	Eggs are present in all breeding ponds at least once every four years. Breeding pond = a pond in which egg-laying and successful metamorphosis is likely to occur at least once every 4 years.	Eggs should be present through spring though eggs are normally laid starting mid-February. Combine survey visit with adult attribute.
2. Adults	Record sum total of adults from both ponds in the spring (likely mid-April – mid-May) for 4 consecutive years within each 6 year reporting cycle. 3 visits per year are required. Derive peak by summing counts across site on "best" night for each season.	At least 20% of peak count (highest site total for 3 monitoring rounds) for 4 consecutive years	Considerable between-year variation is frequent.
3. Presence of ponds	Record number of ponds once every 3 years at any time of the year.	2 ponds notified. No net loss of ponds from date of designation.	Breeding and non-breeding ponds to be included. Recent counts suggest the smaller pond has greater breeding success.
4. Aquatic macrophyte cover	One visual assessment between May and mid-September undertaken for 4 consecutive years within each 6 year	"Good" cover of marginal vegetation, emergent, submerged and/or floating vegetation to be present in 50% of breeding ponds. "Good defined	Attribute serves as a proxy for detecting eutrophication, toxic

	reporting cycle	as: 25 – 100% of margin covered; and 25 – 75% of pond bottom/midwater/surface covered.	spills, catastrophic reduction in invertebrate community, or underlying water quality issues.
5. Pond persistence	Record approximate depth of water in breeding ponds between mid-August and mid-September once every 3 years.	Levels should be maintained between 500-1000mm.	Target reflects historical persistence of pond.
6. Pond shading by scrub/trees	Visual assessment of extent and orientation of pond margin solidly shaded by vegetation overhanging or adjacent to the pond margin (not floating or emergent macrophytes) to be recorded once every 3 years.	<20% of the 2 ponds' southern margins should be subject to solid shading.	The ponds' are orientated along a north south axis. Scrub and trees to the south shield the site from neighbouring houses.
7. Fish and wildfowl	Visual assessment of fish and stocked wildfowl or evidence of presence to be recorded between March – September, for 4 consecutive years within each 6 year reporting cycle. Any number of fish and wildfowl at >4 pairs/ha of open water to fail target.	Fish and wildfowl problems absent from both ponds.	All species of fish known to be predators of great crested newt are to be considered. Wildfowl refers to ducks, swans or geese. Not natural populations of moorhens.
8. Terrestrial habitat extent	Walkover and comparison with map/aerial photo to determine area. Semi-natural habitats within 500m of breeding ponds to be included. Assess presence of fragmentation any time of the year, once every 3 years.	No loss of area or fragmentation of site (through significant barriers to newt dispersal), compared with status at designation.	Mowing of paths and neighbouring grassland needs to take account of great crested newts.
9. Terrestrial refuge habitat – structure and quality	Visual assessment at any time of the year, recorded once every 3 years.	The presence of a suitable terrestrial refuge habitat which includes: Coarse tussock forming grasses; Deadwood; Scrub; Root systems along hedgerow feature; and Purpose build refugia.	

SCREENING

3 **Is the proposal directly connected with, or necessary to, conservation management of the designated Natura site?**
No.

4 **Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated Natura site.**

- Air pollution effects from thermal treatment stack emissions; and
- Air pollution effects from traffic; and
- Effects from hydrological links.

5 **Consider the key phases of development and the risk of effects associated with each.**
Opeational phase for each.

6 **Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known.**
Operational impacts from thermal treatment emissions to standing water and associated macrophyte vegetation resulting in lowering of water quality for newts.

7 **Is the plan/project likely to have a significant effect on Lyppard Grange Ponds SAC, either alone or in combination, with other plans or projects?**
Yes

Table A1.3 Screening Appraisal of the Implications of the WWCS on Bredon Hill SAC

BREDON HILL

SITE DESCRIPTION

1 Brief description of European site

Bredon Hill Special Area of Conservation (SAC) is situated to the southwest of Evesham city centre in the county of Worcestershire. Bredon Hill (359.86 ha) is described as a hilly area containing some lowland and slope regions. The geology of the area is clay and limestone. The area is predominantly covered by non-forest areas cultivated with woody plants as well as smaller areas of heath/scrub and dry grassland. It is important because of the presence of *Limoniscus violaceus* (Violet click beetle), for which Bredon Hill is one of three known outstanding localities in the UK.

The site is primarily designated for supporting the *Annex II* species, *Limoniscus violaceus* (Violet click beetle).

Qualifying Interests for which the site is designated:
Annex II Species:

SCIENTIFIC NAME	COMMON NAME / DESCRIPTION
Limoniscus violaceus	The violet click beetle is primarily associated with ancient trees. They live within the undisturbed wood-mould at the base of the central cavities of either beech or ash trees. They are considered extremely rare across UK and Europe.

Description of qualifying species importance and vulnerability

Lumoniscus violaceus is present in only three known outstanding localities in the UK, with Bredon Hill being one of them.

The main threat to *Lumoniscus violaceus* is the lack of replacement generation of trees for the current ancient trees, which are relatively small to date.

2 Conservation Objectives for the European site.

The Conservation Objectives (COs) for Bredon Hill SAC are focussed on the component Site of Special Scientific Interest (SSSI): Bredon Hill.

The COs for the European interest on the SSSI are:

to maintain*, in favourable condition, the:
broadleaved, mixed and yew woodland; and
the lowland parkland and wood pasture.

*maintenance implies restoration if the feature is not currently in favourable condition.

The lowland calcareous grassland is also noted as a designated interest feature of the SSSI, though not included in the SAC.

The Favourable Condition Table for Bredon Hill SSSI is used to determine if the site is in favourable condition, and can be used, in combination with issues specific to the project, to inform the scope and nature of any Appropriate Assessment (AA) under the Habitat Regulations.

The attributes of each qualifying habitat within the SAC and the measures and targets for their conservation are summarised below.

***Wood pasture/parkland*:**

Attribute	Measure	Target	Comment
1. Habitat extent	Field survey, aerial photography and comparison with baseline data/map; and Record number of individual trees (including standing dead trees and stumps).	No loss of semi-natural wood pasture mosaic area; No reduction in number of veteran trees; and Acceptable loss due to active slumping is acceptable providing regeneration opportunities via suitable management.	
2. Structure and Natural process	Field survey (structured walk and/or transects – 10 samples per unit).	Distribution of key species across age categories (seedlings/saplings to ancient trees, standing dead trees, fallen trees and stumps; Scatter of veteran trees is present across the site so as to provide at least 5 veterans (minimum of 3 age classes of the key tree species) within adjoining parkland or broadleaf woodland; and Parkland deadwood (more than 20cm) left in situ or retained as close as possible to the tree.	
3. Composition	Field survey (structured	At least 95% of cover in any one layer of site-native or acceptable naturalised species.	

	walk and/or transects – 10 samples per unit).	W21 Scrub relates to wood pasture units: Target = Crataegus should be present in at least 10% of SRS Invertebrate targets: 2+ different surfaces in >/= 20% of SRS Single surface should be present in no more than 10% of SRS
4. Indicators of local distinctiveness	Field survey (structured walk and/or transects – 10 samples per unit).	Ground flora: 80% of ground flora cover referable to relevant NVC community; Wet flushes: Key habitat component to be mapped as part of condition assessment and FCT map updated accordingly; and Transitions: From W21 wood pasture scrub element to canopy woodland (W8/W10).
5. Regeneration potential	Field survey (structured walk and/or transects – 10 samples per unit).	Sufficient density of seedlings through to saplings to young trees to maintain canopy density over a 10 yr period. No more than 20% of areas to be regenerated by planting. All planting material of locally native stock.
6. Condition of ancient trees – state of decay	Signs of internal decay and hallowing in large individuals.	Significant proportion of larger trees with external signs of decay.
7. Condition of ancient trees - stability	Number/proportion of ancient trees with large sail area, high centre of gravity, large number of heavy limbs or neglected pollard re-growth and liability to wind-throw.	Those ancient trees at risk of wind-throw should be indentified; and 5% of such trees is unfavourable.
8. Position and degree of exposure of ancient trees and stumps	Proportion of ancient trees/stumps exposed to extremes of	40 – 60% of ancient trees/stumps should be in a warm microclimate in diverse conditions of sunlight, and not in complete shade.

	desiccation or cool summer conditions.	
9. Ancient trees not adversely affected by competition for light, water and space from other species or vigorous regeneration	Presence of other competing vegetation (rhododendron, bracken and others).	No rhododendron, plantation conifers and <20% bracken cover within any stand of ancient tree; and Younger regenerating or planted trees, including desirable species, should not be infringing on the immediate environs of individual ancient trees.

Broadleaved woodland:

Attribute	Measure	Target
1. Habitat extent	Field survey, aerial photography and comparison with baseline map.	No loss of ancient semi-natural stands and ancient woodlands; and No reduction in number of veteran trees.
2. Structure and Natural processes	Field survey (structured walk and/or transects – 10 samples per unit).	Woodlands Understorey (2-5m) present over at least 20-30% of total stand area; Canopy area present over 60-90% of woodland stand area (80%+ canopy cover maintained in areas with wet flushes to maintain damp, humid microclimate for invertebrates; At least three age classes spread across the average life expectancy of key tree species; and Minimum of three fallen lying trees (>20cm diameter) showing signs of decay per ha and four trees per ha allowed to die standing.
3. Composition	Field survey (structured walk and/or transects)	At least 95% of cover in any one layer of site-native or acceptable naturalised species; Target: Ash, oak, field maple and pear should be present across the site (beech and S. chestnut should be present in established locations); Invertebrate targets: 2+ different surfaces in >/=20% of SRS, single surface should be present in no more than 10% of SRS; and

		Death, destruction or replacement of native woodland by introduced fauna or other factors to be less than 10% by number or area in a five yr period.
4. Indicators of local distinctiveness	Field survey (structured walk and/or transects)	Ground flora: 80% of ground flora cover referable to relevant NVC community; Wet flushes: Key habitat component to be mapped as part of condition assessment and FCT map updated accordingly; and Transitions: From W21 wood pasture scrub element to canopy woodland (W8/W10) – to be mapped as part of condition assessment, maps updates accordingly.
5. Regeneration potential	Field survey (structured walk and/or transects)	Sufficient density of seedlings through to saplings to young trees to maintain canopy density over a 10 yr period. No more than 20% of areas to be regenerated by planting. All planting material of locally native stock.
6. Vegetation heterogeneity: woodland	Undertake a Structural Recording Survey (SRS) or Structural Monitoring Transect (SMT) making 10 'Roundrats'	Surface numbers 1 (Bare forest soils, muds or thin water films), 2 (Short layer), 3 (Medium dry layer), 4 (Medium wet layer), 5 (Young scrub) and 6 (Extensive mature scrub and trees on edges of unit) to be recorded as the following: Surfaces 1 & 2 present in 1 or 2 roundrats; Surfaces 4 & 6 present in 3 or fewer roundrats; >2 different surfaces present in at least 2 roundrats; and Single surface present in <6 roundrats.
7. Condition of ancient trees – state of decay	Signs of internal decay and hallowing in large individuals.	Significant proportion of larger trees with external signs of decay.
8. Condition of ancient trees - stability	Number/proportion of ancient trees with large sail area, high centre of gravity, large number of heavy limbs or neglected pollard re-growth and liability to wind-throw.	Those ancient trees at risk of wind-throw should be indentified; and 5% of such trees is unfavourable.
9. Position and degree of exposure of ancient trees and stumps	Proportion of ancient trees/stumps exposed to extremes of desiccation or cool summer conditions.	50 – 70% of ancient trees/stumps should be in a warm microclimate in diverse conditions of sunlight, and not in complete shade.
10. Ancient	Presence of other	No rhododendron, plantation conifers and <20% bracken cover within any stand of

	trees not adversely affected by competition for light, water and space from other species or vigorous regeneration	competing vegetation (rhododendron, bracken and others).	ancient tree; and Younger regenerating or planted trees, including desirable species, should not be infringing on the immediate environs of individual ancient trees.

SCREENING

3 Is the proposal directly connected with, or necessary to, conservation management of the designated European site?
No.

4 Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated European site.
- Air pollution e effects from thermal treatment stack emissions; and

Air pollution effects from traffic

5 Consider the key phases of development and the risk of effects associated with each.
Operational phases.

6 Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known.
Operational phase of thermal treatment facilities may result in critical levels of nutrient nitrogen at Bredon Hill being exceeded which could alter the vegetation composition favoured by the violet click beetle.
Hydrological links to the SAC would need to be assessed if activities were likely to effect these.

7 Is the plan/project likely to have a significant effect on Bredon Hill SAC, either alone or in combination, with other plans or projects?
Yes

Table A1.4 Screening Appraisal of the Implications of the WWCS on Dixton Wood SAC

DIXTON WOOD SAC		
SITE DESCRIPTION		
1	**Brief description of European site**	Dixton Wood Special Area of Conservation (SAC) is situated to the east of the M5 corridor, and south-south-west of Evesham city centre in the county of Gloucestershire. Dixton Wood (13.14 ha) is an area of broadleaved woodland (formerly partially grazed) with a dominance of ash, including large ancient pollards. The geology of the area is clay. It is important because of the presence of *Limoniscus violaceus* (Violet click beetle), for which Dixton Wood is one of three known outstanding localities in the UK. The site is primarily designated for supporting the *Annex II* species, *Limoniscus violaceus* (Violet click beetle). It was first discovered at Dixton Wood in 1998 and since then has only been identified on a single occasion. It is associated with the decaying timber of the ancient *Fraxinus excelsior* (ash pollards) trees, which are found within Dixton Wood. **Qualifying Interests for which the site is designated:** *Annex II* Species: SCIENTIFIC NAME — COMMON NAME *Limoniscus violaceus* — Violet click beetle *Description of qualifying species importance and vulnerability* *Limoniscus violaceus* is largely dependant on the ash pollards for breeding. There is a lack of future replacement pollards (age-class skewed to older generation) and game management practices.
2	**Conservation objectives for the European site**	The Conservation Objectives for Dixton Wood SAC were not available at the time of writing. The following comment was made in February 2009 by Paul Hackman (Natural England – Gloucestershire): "Site judged against new generic criteria (but need for specific alteration for Dixton to be discussed with Roger Key). Site fails to meet defined targets in respect of population structure of ash trees/coppice (age class structure lacks regeneration and young to medium aged component necessary for future of beetle habitats provision). Significant factors affecting the site are large deer populations (no regeneration either seedling or basal regrowth), future tree stock and vulnerability of existing large stools of which a proportion are susceptible to wind throw or collapse due to size and weight distribution of limbs. Some remedial rescue management required and longer term plans for restocking and possibly premature ageing of trees to prove dead wood resource in current age gap. Specialist advice on coppicing/pollarding of ash required and on best restocking strategy." *maintenance implies restoration if the feature is not currently in favourable condition.

The Favourable Condition Table for the SSSIs are used to determine if the sites are in favourable condition, and can be used, in combination with issues specific to the project, to inform the scope and nature of any Appropriate Assessment (AA) under the Habitat Regulations.

Summary of Favourable Condition Table for Broadleaved woodland:

Attribute	Measure	Target
1. Habitat extent	Field survey, aerial photography and comparison with baseline map.	No loss of ancient semi-natural stands and ancient woodlands; and No reduction in number of veteran trees.
2. Structure and Natural processes	Field survey (structured walk and/or transects – 10 samples per unit).	Woodlands Understorey (2-5m) present over at least 20-30% of total stand area; Canopy area present over 60-90% of woodland stand area (80%+ canopy cover maintained in areas with wet flushes to maintain damp, humid microclimate for invertebrates; At least three age classes spread across the average life expectancy of key tree species; and Minimum of three fallen lying trees (>20cm diameter) showing signs of decay per ha and four trees per ha allowed to die standing.
3. Composition	Field survey (structured walk and/or transects)	At least 95% of cover in any one layer of site-native or acceptable naturalised species; Target: Ash, oak, field maple and pear should be present across the site (beech and S. chestnut should be present in established locations); Invertebrate targets: 2+ different surfaces in >/=20% of SRS, single surface should be present in no more than 10% of SRS; and Death, destruction or replacement of native woodland by introduced fauna or other factors to be less than 10% by number or area in a five yr period.
4. Indicators of local distinctiveness	Field survey (structured walk and/or transects)	Ground flora: 80% of ground flora cover referable to relevant NVC community; Wet flushes: Key habitat component to be mapped as part of condition assessment and FCT map updated accordingly; and Transitions: From W21 wood pasture scrub element to canopy woodland (W8/W10) – to be mapped as part of condition assessment, maps updates accordingly.
5. Regeneration	Field survey (structured walk and/or transects)	Sufficient density of seedlings through to saplings to young trees to maintain canopy density over a 10 yr period. No more than 20% of areas to be regenerated by planting. All

potential		planting material of locally native stock.
6. Vegetation heterogeneity: woodland	Undertake a Structural Recording Survey (SRS) or Structural Monitoring Transect (SMT) making 10 'Roundrats'	Surface numbers 1 (Bare forest soils, muds or thin water films), 2 (Short layer), 3 (Medium dry layer), 4 (Medium wet layer), 5 (Young scrub) and 6 (Extensive mature scrub and trees on edges of unit) to be recorded as the following: Surfaces 1 & 2 present in 1 or 2 roundrats; Surfaces 4 & 6 present in 3 or fewer roundrats; >2 different surfaces present in at least 2 roundrats; and Single surface present in <6 roundrats.
7. Condition of ancient trees – state of decay	Signs of internal decay and hallowing in large individuals.	Significant proportion of larger trees with external signs of decay.
8. Condition of ancient trees - stability	Number/proportion of ancient trees with large sail area, high centre of gravity, large number of heavy limbs or neglected pollard re-growth and liability to wind-throw.	Those ancient trees at risk of wind-throw should be indentified; and 5% of such trees is unfavourable.
9. Position and degree of exposure of ancient trees and stumps	Proportion of ancient trees/stumps exposed to extremes of desiccation or cool summer conditions.	50 – 70% of ancient trees/stumps should be in a warm microclimate in diverse conditions of sunlight, and not in complete shade.
10. Ancient trees not adversely affected by competition for light, water and space from other species or vigorous regeneration	Presence of other competing vegetation (rhododendron, bracken and others).	No rhododendron, plantation conifers and <20% bracken cover within any stand of ancient tree; and Younger regenerating or planted trees, including desirable species, should not be infringing on the immediate environs of individual ancient trees.

SCREENING

DIXTON WOOD SAC

3 Is the proposal directly connected with, or necessary to, conservation management of the European site?

No.

4 Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated site

Air pollution e effects from thermal treatment stack emissions; and

Air pollution effects from traffic

5 Consider the key phases of development and the risk of effects associated with each.

Operational of thermal treatment

6 Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known

Operational phase of thermal treatment facilities may result in critical levels of nutrient nitrogen at Bredon Hill being exceeded which could alter the vegetation composition favoured by the violet click beetle.

Hydrological links to the SAC would need to be assessed if activities were likely to effect these.

7 Is the plan/project likely to have a significant effect on Dixton Wood SAC, either alone or in combination, with other plans or projects?

Yes

Table A1.5 Screening Appraisal of the Implications of the WWCS on Fen Pools SAC

FENS POOLS SAC		
SITE DESCRIPTION		
1	**Brief description of European site**	Fens Pools Special Area of Conservation (SAC) is situated approximately 2 km to the south-west of Dudley city centre in the metropolitan county of West Midlands. Fens Pools (20.4 ha) comprises of three canal feeder reservoirs and a number of smaller ponds. Within the site are a wide range of habitats from open water, swamp, fen and inundation communities as well as unimproved neutral and acidic grassland and scrub. The geology of the site Etruria marls and coal measures of the Carboniferous period. It is important because of the presence of *Triturus cristatus* (Great crested newt), for which Fens Pools is one of the best localities in the UK. The site is primarily designated for supporting the *Annex II* species, *Triturus cristatus* (Great crested newt). It was one of the largest populations recorded in the UK to date. **Qualifying Interests for which the site is designated:** *Annex II* Species: SCIENTIFIC NAME — COMMON NAME *Triturus cristatus* — Great crested newt *Description of qualifying species importance and vulnerability* Fens Pools is considered to be one of the best areas in the United Kingdom for *Triturus cristatus*. The population of *Triturus cristatus* at the site depends on control of fish, maintenance of adequate water quality and protection of surrounding terrestrial habitat from major ground disturbance. A number of ponds in the area are undergoing expansion to counter the desiccation, human disturbance, fish introductions and pollution occurring in the area. Land contamination is identified as a possible future issue given the post-industrial origins of much of the site's surface material.
2	**Conservation objectives for the European site**	To maintain the extent of the amphibian habitat (terrestrial and aquatics). No loss of area or fragmentation of site (through significant barriers to amphibian dispersal) compared with status at designation.
SCREENING		
3	**Is the proposal directly connected with, or necessary to, conservation management of the European site?**	No.

FENS POOLS SAC

4 Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated site

Air pollution effects from thermal treatment stack emissions.

5 Consider the key phases of development and the risk of effects associated with each.

Operational for thermal treatment facilities.

6 Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known

Operational phase of thermal treatment facilities may result in critical levels of nutrient nitrogen at Fen Pools being exceeded which could alter the vegetation composition favoured by great crested newt.

7 Is the plan/project likely to have a significant effect on Fen Pools SAC, either alone or in combination, with other plans or projects?

Yes

A1.6 Screening Appraisal of the Implications of the WWCS on the River Wye SAC

RIVER WYE SAC

SITE DESCRIPTION

1 Brief description of European site

The River Wye Special Area of Conservation (SAC) comprises two component SSSIs. The River Wye (2234.89 ha), on the border of England and Wales, is important for a range of *Annex II* species. The Wye holds the densest and most well-established otter population in Wales and is the best-known site in Wales for white-clawed crayfish. In addition, the Wye has an important population of Atlantic salmon, notably for its very high proportion (around 75%) of multi sea winter (MSW) fish, a stock component which has declined sharply in recent years throughout the UK.

The *Annex I* habitat, Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, is also listed as a primary reason for selection of this site. Another *Annex I* habitat, Transition mires and quaking bogs, is listed as a qualifying feature but is not a primary reason for site selection.

Annex II species which are a primary reason for selection of this site include white-clawed crayfish, sea, brook and river lamprey, twaite shad, Atlantic salmon, bullhead and otter. Allis shad is present as a qualifying feature, but not a primary reason for site selection.

Qualifying Interests for which the site is designated:

Annex I Habitats

SCIENTIFIC NAME	COMMON NAME / DESCRIPTION
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (5.3%)	This habitat is characterised by the abundance of *Ranunculus* spp. (water-crowfoots), subgenus *Batrachium* (*Ranunculus fluitans*, *R. penicillatus* ssp. *penicillatus*, *R. penicillatus* ssp. *pseudofluitans*, and *R. peltatus* and its hybrids). Floating mats of these white-flowered species are characteristic of river channels in early to mid-summer. They may modify water flow, promote fine sediment deposition and provide shelter and food for fish and invertebrate animals.
Transition mires and quaking bogs (0.1%)	Characterised by very wet mires often identified by an unstable `quaking` surface. Transition mires are composed of vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and alkaline fens.

Annex II Species

SCIENTIFIC NAME	COMMON NAME
Austropotamobius pallipes	White-clawed (or Atlantic stream) crayfish
Petromyzon marinus	Sea lamprey
Lampetra planeri	Brook lamprey
Lampetra fluviatilis	River lamprey

Alosa fallax	Twaite shad
Salmo salar	Atlantic salmon
Cottus gobio	Bullhead
Lutra lutra	Otter
Alosa alosa	Allis shad

Description of qualifying habitats quality, importance and vulnerability

Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation – for which this is considered to be one of the best areas in the United Kingdom.

Transition mires and quaking bogs – for which the area is considered to support a significant presence.

Noteworthy Fauna:

Austropotamobius pallipes – for which this is considered to be one of the best areas in the UK.
Petromyzon marinus – for which this is considered to be one of the best areas in the UK.
Lampetra planeri – for which this is considered to be one of the best areas in the UK.
Lampetra fluviatilis - for which this is considered to be one of the best areas in the UK.
Alosa fallax - for which this is considered to be one of the best areas in the UK.
Salmo salar - for which this is considered to be one of the best areas in the UK.
Cottus gobio - for which this is considered to be one of the best areas in the UK.
Lutra lutra - for which this is considered to be one of the best areas in the UK.
Alosa alosa – for which this is considered to support a significant presence.

The River Wye SAC has a number of current vulnerabilities.

Water quality impacts arising from changing agricultural land-use within the catchment are having direct and indirect effects on the SAC interests through effects of diffuse pollution such as nutrient run-off and increased siltation. Synthetic pyrethroid sheep-dips and point-source discharges within the catchment are also affecting water quality. In addition, loss of riparian habitat is occurring as a result of changes in agricultural land-use practices and other factors, including riverside development and the loss of alder tree-cover through disease. Current schemes and management plans set up by Natural England and the Countryside Council for Wales are designed to address such issues.

Fishing activities are implicated in the decline of salmon; initiatives such as the Wye Salmon Action Plan have been introduced to address this issue.

There is increasing demand for abstraction from the river for agriculture and potable water. The impact of this is currently being investigated by the Environment Agency, but maintenance of water levels and flow will be addressed under the review of consents under the Habitats Regulations.

Demand for increased recreational activities is a potential source of concern for the future.

2 Conservation objectives for the European site

The Conservation Objectives for the River Wye SAC are focussed on the component SSSIs:

River Lugg
Lower Wye

The COs for the European interest on the SSSIs are:

to maintain*, in favourable condition, the:

- floating formations of water crowfoot (*Ranunculus*) of plain and sub-mountainous rivers

and populations of:

- atlantic salmon (*Salmo salar*)
- allis shad (*Alosa alosa*)
- twaite shad (*Alosa fallax*)
- bullhead (*Cottus gobio*)
- brook lamprey (*Lampetra planeri*)
- river lamprey (*Lampetra fluviatilis*)
- sea lamprey (*Petromyzon marinus*)
- white-clawed crayfish (*Austropotamobius pallipes*)

and the river and adjoining land as habitat for populations of

- otter (*Lutra lutra*)

*maintenance implies restoration if the feature is not currently in favourable condition.

The Favourable Condition Table for the SSSIs are used to determine if the sites are in favourable condition, and can be used, in combination with issues specific to the project, to inform the scope and nature of any Appropriate Assessment (AA) under the Habitat Regulations.

The attributes of each qualifying habitat within the SAC and the measures and targets for their conservation are summarised below.

Common targets for river habitat and selected species

Attribute	Measure	Target	Comment
Flow	Limits on licensed abstractions after modelling impacts. Audit every 6 years, if possible via CAMS.	Flow regime should be characteristic of the river. As a guideline, the impact (at any point in the SAC) of abstractions should be less than 10% of the naturalised	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural hydrological

		daily mean flow throughout the year. Flow criteria already laid down for the river (e.g. for passage of migrating salmon) should also be complied with.	processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy - long-term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.
Water quality	Biological class - Environment Agency's General Quality Assessment scheme. Assess every 5 years.	'a'	Generally, water quality should not be injurious to any life stage. A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonable integrated picture in relation to many parameters. The Biological Module of the Environment Agency's General Quality Assessment scheme is based on assessment of the macroinvertebrate community. All classified reaches within the site that should contain the interest feature under conditions of high environmental quality should comply with the targets given.
	River Ecosystem Class. Assess against Environment Agency monitoring results.	RE 1	The River Ecosystem Classification 1995 sets standards for dissolved oxygen, biochemical oxygen demand, total and un-ionised ammonia, pH, copper and zinc. It, therefore, covers a number of water quality parameters which can cause problems within river systems. All classified reaches within the site that should contain the interest feature under conditions of high environmental quality should comply with the targets given.
	Suspended solids (annual average). Assessment methods to be agreed with Environment Agency.	<=10mgl l^{-1}	Elevated levels of suspended solids can clog the respiratory structures of the listed species, with salmon being the most susceptible. Suspended solids measurements are also essential to the

			estimation of particulate loads within the river network (in combination with gauged flow data), which provides an indication of the risk of siltation problems. The target of 25mgl^{-1} is based on the EC Freshwater Fish Directive - a more precautionary figure has been used for salmon to help protect substrates used for salmon spawning. Siltation is thought to be a major issue affecting the Rivers Wye and Lugg with evidence that catchment scale soil erosion is a significant impact. Further investigation of the fate of sediment in the river and measures to reduce soil erosion are needed.
	Soluble Reactive Phosphorus (annual mean) (Total Reactive Phosphorus as measured by the Environment Agency is acceptable)	Provisional targets apply to reaches according to river type/mixture of types: 0.1mg/l lowland large rivers flowing off chalk and sandstone (Type VI) 0.2mg/l interim target for lowland rivers on clay substrates and large alluvial rivers (Type II)	Elevated phosphorus levels interfere with competitive interactions between different higher plant species and between higher plants and algae, leading to the loss of characteristic higher plants and large diurnal sags in dissolved oxygen levels. *Ranunculus* habitat is extremely vulnerable. The respiration of artificially large growths of benthic algae may generate poor substrate conditions for species such as the lampreys (in the larval stage).
River substrate	Silt content (Optimal form of measurement to be decided in consultation with the Environment Agency.)	Channels should be dominated by clean gravels. Maximum silt content: *Ranunculus* - <20% in top 10cm of mid-channel gravels; salmon and lampreys -<10% in top 30cm of spawning substrates; bullhead - no excessive siltation on the surface of coarse substrates; allis/twaite shad - <= 5% silton surface of spawning substrate.	Siltation of riverine sediments, caused by high particulate loads and/or reduced scour within the channel, is a major threat to interest features. Elevated silt levels can interfere with the establishment of *Ranunculus* plants, and with egg and fry survival in salmon, lampreys and bullhead. The requirements of species vary depending upon use of the substrate. Some relate to the level of aeration within the substrate and some to the ability of the substrate to physically catch eggs or plant fragments in surface interstices. The target for salmon has been used for lamprey species in the absence of species-specific information (although it is recognised that lamprey utilise only the top few

		centimetres for spawning).
	(Silt is defined as fines <60 microns.)	Where there are upwelling springs within the river bed, the target for salmon can be revised upwards, due to increased substrate aeration. Sources of silt include - run-off from arable land and land trampled by livestock, sewage and industrial discharges.

SCREENING

3 Is the proposal directly connected with, or necessary to, conservation management of the designated Natura site?
No.

4 Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated Natura site
Air pollution

5 Consider the key phases of development and the risk of effects associated with each.
Operational

6 Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known
Air pollution during operation of a thermal treatment facility could have an impact on the riparian vegetation which supports some of the species for which the site is designated.

7 Is the plan/project likely to have a significant effect on the River Wye SAC, either alone or in combination, with other plans or projects?
Yes

Table A1.7 Screening Appraisal of the Implications of the WWCS on Walmore Common SPA

WALMORE COMMON SPA

SITE DESCRIPTION

1 Brief description of European site

Walmore Common Special Protection Area (SPA) is situated on the floodplain of the River Severn, north of the village of Chaxhill, approximately 10 km to the south-west of Gloucester, in the county of Gloucestershire. Walmore Common (52.85 ha) is an area of damp grassland, ditches and peatland. The geology of the area is alluvium and clay.

The site is primarily designated for supporting the *Annex I* species, *Cygnus columbianus bewickii* (Bewick's swan). The area is subject to winter flooding, which creates suitable conditions for regular wintering birds.

Qualifying Interests for which the site is designated:

Annex I Species:

SCIENTIFIC NAME	COMMON NAME
Cygnus columbianus bewickii	Bewick's swan

Description of qualifying species importance and vulnerability

During winter months, the site supports at least 1.5% of the GB population of *Cygnus columnianus bewickii*. They are attracted to the site by the grassland for feeding and roosting. The grassland is currently maintained by grazing and natural winter flooding (dependant on rainfall, run-off and associated river levels). A water level management plan will ensure conditions suitable for wintering birds is maintained. This includes the maintenance and enhancement of marshy grassland and ditches from spring through to autumn, by high water levels.

2 Conservation objectives for the European site

Interest feature 1: Internationally important population of regularly occurring *Annex 1* species: Bewick's swan

The conservation objective is to maintain the Bewick's swan population and its supporting habitats in **favourable condition**, as defined below:

This conservation objective is subject to review.

The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:

- the 5 year peak mean population size for the Bewick's swan population is no less than individuals (ie the 5 year peak mean between 1988/9 - 1992/3);

SCREENING

3 Is the proposal directly connected with, or necessary to, conservation management of the European site?
No.

4 Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated site
Operationl impacts from thermal treatment emissions.

5 Consider the key phases of development and the risk of effects associated with each.

6 Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known
Air pollution during operation of a thermal treatment facility could have an impact on the grassland vegetation which supports Bewick's swan for which the site is designated.

7 Is the plan/project likely to have a significant effect on Walmore Common SPA, either alone or in combination, with other plans or projects?
Yes

A1.8 Screening Appraisal of the Implications of the WWCS on the Severn Estuary cSAC, SPA and Ramsar

SEVERN ESTUARY CSAC, SPA AND RAMSAR

SITE DESCRIPTION

1 Brief description of European Site

Severn Estuary cSAC (73715.4 ha) is located between Wales and England in south-west Britain. It is a large estuary with extensive intertidal mud-flats and sand-flats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with sub-tidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second- highest tidal range in the world (after the Bay of Fundy in Canada).

Annex I habitats that are a primary reason for the selection of the site:
Estuaries
Mudflats and sandflats not covered by seawater at low tide
Atlantic salt meadows
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
Sandbanks slightly covered by sea water all the time
Reefs
Annex II species that are a primary reason for selection of the site:
Petromyzon marinus (Sea lamprey)
Lampetra fluviatilis (River lamprey)
Alosa fallax (Twaite shad)

Qualifying Interests for which the site is designated:
Annex I Habitats

SCIENTIFIC NAME	COMMON NAME / DESCRIPTION
Estuaries	Estuaries are defined as the downstream part of a river valley, subject to the tide and extending from the limit of brackish water. There is a gradient of salinity from freshwater in the river to increasingly marine conditions towards the open sea.

Mudflats and sandflats not covered by seawater at low tide	Mudflats form in the most sheltered areas of the coast, usually where large quantities of silt derived from rivers are deposited in estuaries. The sediment is stable and communities are typically dominated by polychaete worms and bivalve molluscs and may support very high densities of the mud-snail *Hydrobia ulvae*. The high biomass of invertebrates in such sediments often provides an important food source for waders and wildfowl, such as common shelduck *Tadorna tadorna*, knot *Calidris canuta* and dunlin *Calidris alpina*.
Atlantic salt meadows	Atlantic salt meadows develop when halophytic vegetation colonises soft intertidal sediments of mud and sand in areas protected from strong wave action. This vegetation forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented and the saltmarshes can cover large areas, especially where there has been little or no enclosure on the landward side. The vegetation varies with climate and the frequency and duration of tidal inundation. Grazing by domestic livestock is particularly significant in determining the structure and species composition of the habitat type and in determining its relative value for plants, for invertebrates and for wintering or breeding waterfowl.
Reefs	Reefs are rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. Intertidal areas are only included within this *Annex I* type where they are connected to subtidal reefs. Reefs are very variable in form and in the communities that they support. Two main types of reef can be recognised: those where animal and plant communities develop on rock or stable boulders and cobbles, and those where structure is created by the animals themselves (biogenic reefs).
Sandbanks slightly covered by sea water all the time	Sandbanks which are slightly covered by sea water all the time consist of sandy sediments that are permanently covered by shallow sea water. Shallow sandy sediments are typically colonised by a burrowing fauna of worms, crustaceans, bivalve molluscs and echinoderms. Mobile epifauna occur at the surface of the sandbank.

Annex II Species

SCIENTIFIC NAME	COMMON NAME

Petromyzon marinus	Sea Lamprey
Lampetra fluviatilis	River Lamprey
Alosa fallax	Twaite Shad

Description of qualifying habitats quality, importance and vulnerability
The conservation of the site features is dependent on the tidal regime. The tidal range in the Severn Estuary is the second-highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats and the presence of high sediment loads.

The estuary is therefore vulnerable to largescale interference, mainly as a result of human actions. These include land-claim, aggregate extraction, physical developments such as barrage construction and other commercial construction activities, flood defences, industrial pollution, oil spillage and tourism-based activities and disturbance.

There are several management mechanisms that seek to secure sustainable management of the Severn Estuary and its wildlife interest. A management scheme under Regulation 34 of the Habitats Regulations was established in 2004 in relation to the international bird interest that underpins designation as a Special Protection Area.

The Severn Estuary is fringed by saltmarsh and holds the largest aggregation of saltmarsh in the south and south-west of the UK. Recent monitoring has identified that there is a complicated present day pattern of erosion and accretion of the saltmarshes throughout the estuary and some parts appear to be exhibiting the effects of coastal squeeze. The Severn Estuary saltmarshes are generally grazed by sheep and/or cattle, a significant factor in determining the plant communities found within them.

Saltmarshes and mudflats have an important role to play in estuarine processes, both through the recycling of nutrients within the estuary and through their role as soft sea defences, dissipating wave energy. They are highly productive biologically, providing organic material that support other features within the marine ecosystem. They also have an important physical role, acting as a sediment store to the estuary as a whole and in providing feeding and roosting sites for waders and wildfowl particularly at high tide.

Severn Estuary SPA

The extreme tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide- swept sand and rock. The species-poor invertebrate community includes high densities of ragworms, lugworms and other invertebrates forming an important food source for passage and wintering waders. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK. The site is of importance during the spring and autumn migration periods for waders moving up the west coast of Britain, as well as in winter for large numbers of waterbirds, especially swans, ducks and waders.

The Severn Estuary forms part of the complex chain of estuary sites along the western coast of the UK that provide habitats for migratory waterfowl. The relatively mild winter weather conditions found here compared to continental Europe at similar latitudes can be of additional importance to the survival of wintering waterfowl during periods of severe weather. It is especially important when there is severe weather affecting other sites further north and on the east coast of Britain. The Severn Estuary ranks amongst the top ten British estuaries for the size of visiting waterfowl populations that it supports over winter (Musgrove et. al., 2001). Outside of this period, it is of particular importance as a

staging area in autumn and spring for migratory waterfowl species as it lies on the East Atlantic Flyway route.

This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on *Annex I* of the Directive:

Over winter;

Bewick's Swan *Cygnus columbianus bewickii*, 280 individuals representing at least 4.0% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

Key Supporting Habitat:

Intertidal mudflats and sandflats - The focal area for the Bewick's swans is the upper Severn Estuary in the vicinity of the New Grounds, Slimbridge area. The mudflats and sandflats exposed as the tide falls where the estuary widens in the upper reaches of the site at Waveridge Sands, Frampton Sands and The Noose are used as a safe refuge areas when the birds are disturbed.

Saltmarsh communities **-** The birds feed on the saltmarsh and the transition from saltmarsh to coastal grazing marsh in front of the sea defences in the upper estuary at The Dumbles, where areas of the high marsh are mainly affected only by brackish water during tidal inundation. They favour areas that have unrestricted views for the early detection of predators.

Bewick's swan graze on a range of 'soft' meadow grasses such as *Agrostis stolonifera* and *Alopecurus geniculatus* found in wet meadows which are outwith the European marine site boundary.

This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

On passage;

Ringed Plover *Charadrius hiaticula*, 655 individuals representing at least 1.3% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

Over winter;

Curlew *Numenius arquata*, 3,903 individuals representing at least 1.1% of the wintering Europe - breeding population (5 year peak mean 1991/2 - 1995/6)

Dunlin *Calidris alpina alpina*, 44,624 individuals representing at least 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)

Pintail *Anas acuta*, 599 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)

Redshank *Tringa totanus*, 2,330 individuals representing at least 1.6% of the wintering Eastern Atlantic - wintering population (5 year peak mean

		1991/2 - 1995/6) Shelduck *Tadorna tadorna*, 3,330 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6) **Severn Estuary Ramsar** Assemblage qualification: A wetland of international importance. The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl Over winter, the area regularly supports 93,986 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Gadwall *Anas strepera*, Shelduck *Tadorna tadorna*, Pintail *Anas acuta*, Dunlin *Calidris alpina alpina*, Curlew *Numenius arquata*, Redshank *Tringa totanus*, Bewick's Swan *Cygnus columbianus bewickii*, Wigeon *Anas penelope*, Lapwing *Vanellus vanellus*, Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Shoveler *Anas clypeata*, Pochard *Aythya ferina*, Tufted Duck *Aythya fuligula*, Grey Plover *Pluvialis squatarola*, White-fronted Goose *Anser albifrons albifrons* , Whimbrel *Numenius phaeopus*. Saltmarsh - Upper and lower saltmarsh provide important feeding and roosting areas for the internationally important assemblage of waterfowl throughout the estuary. The European white-fronted geese graze on a range of saltmarsh grasses and herbs. The birds feed on the saltmarsh and the transition to coastal grazing marsh in front of the sea defences in the upper estuary.
2	**Conservation objectives for the European site**	**The conservation objective for the "estuaries" feature of the Severn Estuary cSAC is to maintain the feature in favourable condition, as defined below:** The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the total extent of the estuary is maintained; • the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime)of the estuary is maintained; • the characteristic range and relative proportions of sediment sizes and sediment budget within the site is maintained; • the extent, variety and spatial distribution of estuarine habitat communities within the site is maintained; • the extent, variety, spatial distribution and community composition of notable communities is maintained; • the abundance of the notable estuarine species assemblages is maintained or increased; • the physio-chemical characteristics of the water column support the ecological objectives described above; and • toxic contaminants in water column and sediment are below levels which would pose a risk to the ecological objectives described above. **The conservation objective for the "subtidal sandbanks" feature of the Severn Estuary cSAC is to maintain the feature in favourable condition, as defined below:** The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: • the total extent of the subtidal sandbanks within the site is maintained; • the extent and distribution of the individual subtidal sandbank communities within the site is maintained; • the community composition of the sub tidal sandbank feature within the site is maintained; • the variety and distribution of sediment types across the subtidal sandbank feature is maintained; and

- the gross morphology (depth, distribution and profile) of the subtidal sandbank feature within the site is maintained.

The conservation objective for "mudflats and sandflats" feature of the Severn Estuary cSAC is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:

- the total extent of the mudflats and sandflats feature is maintained;
- the variety and extent of individual mudflats and sandflats communities within the site is maintained;
- the distribution of individual mudflats and sandflats communities within the site is maintained;
- the community composition of the mudflats and sandflats feature within the site is maintained; and
- the topography of the intertidal flats and the morphology (dynamic processes of sediment movement and channel migration across the flats) are maintained.

The conservation objective for the "Atlantic salt meadow" feature of the Severn Estuary cSAC is to maintain the feature in favourable condition, as defined below:

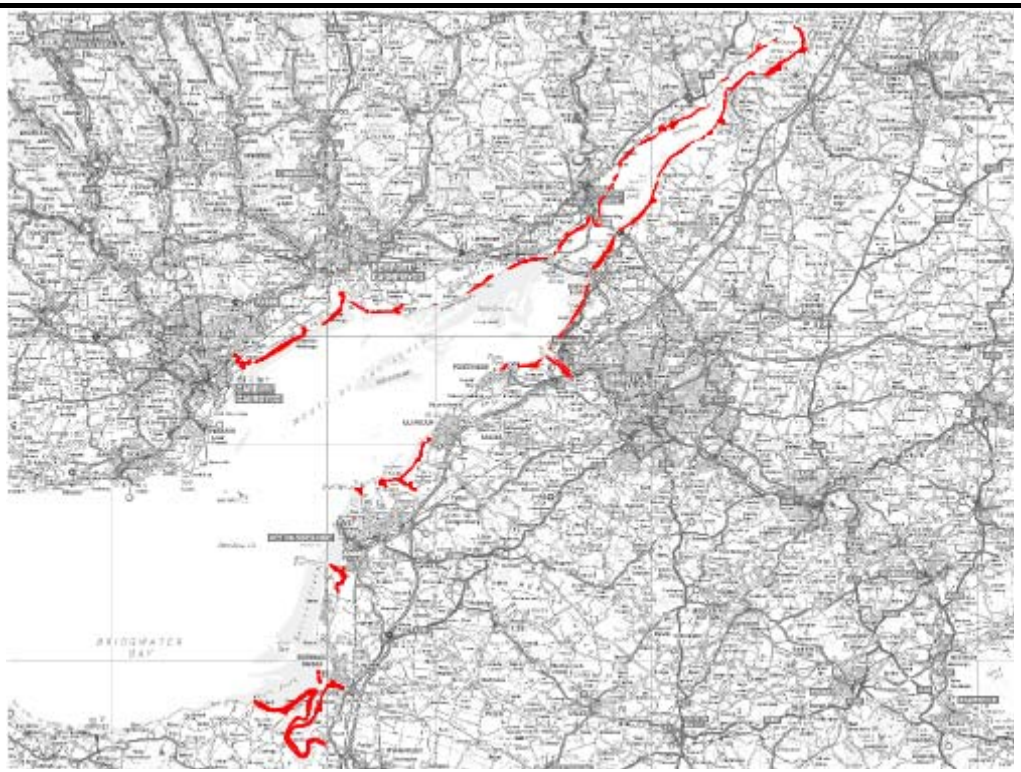
The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:

- the total extent of Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;
- the extent and distribution of the individual Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;
- the zonation of Atlantic salt meadow vegetation communities and their associated transitions to other estuary habitats is maintained;
- the relative abundance of the typical species of the Atlantic salt meadow and associated transitional vegetation communities is maintained;
- the abundance of the notable species of the Atlantic salt meadow and associated transitional vegetation communities is maintained;
- the structural variation of the salt marsh sward (resulting from grazing) is maintained within limits sufficient to satisfy the requirements of conditions iv and v above and the requirements of the Ramsar and SPA features;
- the characteristic stepped morphology of the salt marshes and associated creeks, pills, drainage ditches and pans, and the estuarine processes that enable their development, is maintained; and
- any areas of *Spartina anglica* salt marsh (SM6) are capable of developing naturally into other saltmarsh communities.

The total extent of all four of the above subfeatures in the cSAC is estimated to be 1400 ha, distributed in the cSAC

Since the late 1990s Natural England's condition assessment has identified that parts of the saltmarsh within the Severn Estuary that appear to be exhibiting the effects of coastal squeeze. For this reason NE and CCW do not consider it sufficient simply to seek to maintain the existing saltmarsh resource, rather it is our advice that measures will be required which seek to recreate the approximate extent of saltmarsh habitat present within the estuary in 1995 (the year the Severn Estuary was first identified as a proposed SAC); whilst at all times working within the framework of seeking a sustainable estuary form.

Extent of Atlantic Salt Meadows Habitat:



This map shows the extent of all communities, including transition communities, included in the Atlantic salt meadows feature and is based on the 1998 NVC Survey.

The conservation objective for the "reefs" feature of the Severn Estuary cSAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:

- the total extent and distribution of *Sabellaria* reef is maintained;
- the community composition of the *Sabellaria* reef is maintained;
- the full range of different age structures of *Sabellaria* reef are present;
- the physical and ecological processes necessary to support *Sabellaria* reef are maintained

The conservation objective for the river lamprey *Lampetra fluviatilis* feature of the Severn Estuary cSAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:

- the migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- the size of the river lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
- the abundance of prey species forming the river lamprey's food resource within the estuary, is maintained.
- toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

The conservation objective for the sea lamprey *Petromyzon marinus* feature of the Severn Estuary cSAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes each of the following conditions are met:

- the migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- the size of the sea lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained as is at a level that is sustainable in the long term;
- the abundance of prey species forming the sea lamprey's food resource within the estuary, is maintained.
- toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

The conservation objective for the twaite Shad *Alosa fallax* feature of the Severn Estuary cSAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:

- the migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and their spawning rivers is not obstructed or impeded by physical barriers, changes in flows or poor water quality;
- the size of the twaite shad population within the Severn Estuary and the rivers draining into it is at least maintained and is at a level that is sustainable in the long term;
- the abundance of prey species forming the twaite shad's food resource within the estuary, in particular at the salt wedge, is maintained; and
- toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

Note – The River Lamprey, sea lamprey and Twaite Shad populations of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore they can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC sea lamprey shad feature are also met in full and there is a continued recorded presence of these species in the River Severn.

Conservation Objectives for Severn Estuary SPA

In recognition of the fact that bird populations on a site may change in response to wider national or international trends or events, this Regulation 33 advice addresses the habitat conditions on the site necessary to support the bird populations, as well as the bird populations

themselves. "Supporting habitats" are identified which describe the key habitats within the European marine site necessary to support the interest features i.e. the qualifying bird species. The "favourable condition table" contains further detail on habitat conditions.

Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. Different bird species exploit different parts of a marine area and different prey species. Changes in the habitat may therefore affect them differently. The most important factors related to this are:

- current extent and distribution of suitable feeding and roosting habitat (eg saltmarsh, mudflats, shingle and rocky shores);
- sufficient prey availability (eg crustaceans, small fish, molluscs, worms and seeds);
- levels of disturbance maintained at or below levels necessary to provide favourable conditions for birds' feeding and roosting areas;
- water quality necessary to maintain intertidal plant and animal communities; and
- fresh water quantity, tidal flows, salinity gradients and grazing necessary to maintain saltmarsh conditions suitable for bird feeding and roosting.

There are also a number of habitats, such as the wet coastal grazing marsh, improved grassland and open standing waters that support the qualifying bird species and occur within the SPA boundary. However, these habitats lie above highest astronomical tide and therefore are not within the European marine site. Objectives to maintain these aspects of bird interest in favourable condition are found within Natural Englands and the Countryside Council for Wales' conservation objectives for the relevant SSSI within the SPA boundary and will be dealt with through relevant procedures outlined in the Conservation (Natural Habitats &c.) Regulations 1994.

Some species will also use areas of land and coastal waters outside the boundaries of both the European marine site and the SPA. Relevant authorities need to have regard to such adjacent interests, as they might be affected by activities taking place within, or adjacent to the European marine site.

The SPA conservation objectives focus on habitat condition in recognition that bird populations may change as a reflection of national or international trends or events.

Subject to natural change, maintain in favourable condition the habitats for the internationally important populations of the species as listed in *Box 6.1*, in particular:

- Intertidal mudflats and sandflats (Annex 1 species, migratory species and waterfowl assemblages);
- Saltmarsh communities (Annex 1 species, migratory species and waterfowl assemblages); and
- Shingle and rocky shore (migratory species and waterfowl assemblages).

Interest feature 1: Internationally important population of regularly occurring *Annex 1* species: Bewick's swan

The conservation objective is to maintain the Bewick's swan population and its supporting habitats in **favourable condition**, as defined below:

This conservation objective is subject to review.

The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes, each of the following

conditions are met:

- the 5 year peak mean population size for the Bewick's swan population is no less than 289 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- the extent of saltmarsh at the Dumbles is maintained;
- the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;
- the extent of vegetation with an effective field size of >6 ha and with unrestricted bird sightlines > 500m at feeding, roosting and refuge sites are maintained;
- greater than 25% cover of suitable soft leaved herbs and grasses in winter season throughout the transitional saltmarsh at the Dumbles is maintained; and
- aggregations of Bewick's swan at feeding, roosting and refuge sites are not subject to significant disturbance.

Favourable Condition Table for supporting habitats in the Severn Estuary SPA European marine site

Feature	Supporting Habitat	Attribute	Measure	Target	Comments
Internationally important *Annex 1* species: Bewick's swan	Saltmarsh	Habitat extent	Area (ha) measured once per reporting cycle.	At The Dumbles, no decrease in extent from 76 ha.	Saltmarsh provides an important feeding and roosting habitat for Bewick's swans on The Dumbles - saltmarsh/transition wet grassland in front of sea defences.
		Vegetation characteristics	Abundance of suitable soft leaved herbs and grasses - % cover (frequency to be determined)	Greater than 25% cover during the winter season.	Bewick's swans graze on soft wet meadow grasses such as *Agrostis stolonifera*, *Glyceria fluitans* and *Alopecurus geniculatus* which are found in the transition of saltmarsh to grassland.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines. Areas of vegetation with an effective field size of >6ha	Bewick's swan require unrestricted views >500m to allow early detection of predators when feeding and roosting

	Intertidal mudflats and sandflats	Habitat extent	Area (ha), measured once per reporting cycle.	At Frampton Sands, Waveridge Sands and the Noose, no decrease in extent from 980 ha	The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions.	No increase in obstructions to existing bird sightlines.	Bewick's swan require unrestricted views >500m to allow early detection of predators when feeding and roosting.

Favourable Condition Table for qualifying features in the Severn Estuary European marine site

Feature	Attribute	Measure	Target	Comments
Internationally important *Annex 1* species: Bewick's swan	Population size	5 year peak mean number of individuals	No less than 289 individuals [ie the 5 year peak mean between 1988/9 - 1992/3]	Mainly found in the Upper Severn Estuary at Slimbridge
	Proportion of biogeographic population	% of NW European population	% of NW European population	WeBS counts provide this information
	Distribution	Number and location of sectors occupied at low tide	No decrease in use of the number of sectors and their distribution established as baseline	WeBS low tide counts display distribution information by sector (not annual counts) Birds use certain sectors to a greater or lesser degree from year to year

	Disturbance in feeding and roosting areas	Reduction or displacement of wintering birds	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.

Feature	**Attribute**	**Measure**	**Target**	**Comments**
Internationally important Figures derived from WeBS counts. populations of regularly occurring migratory species and Internationally important assemblage of waterfowl	Population size	5 year peak mean number of individuals	No less than 68,026 individuals in the assemblage [ie the 5 year peak mean between 1988/9 - 1992/3] Target number of *Annex II* bird species: Dunlin – >41,683; European White-fronted Goose >3,002; Shelduck >2,892; Redshank >2,013; [ie the 5 year peak mean between 1988/9 - 1992/3].	Figures derived from WeBS counts.
	Distribution	Number and location of sectors occupied at low tide	No decrease in use of the number of sectors and their distribution established as baseline.	In some years birds use certain sectors to a greater or lesser degree. WeBS low tide counts display distribution information by sector (not annual counts).

	Disturbance in feeding and roosting areas.	Reduction or displacement of wintering birds	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline.	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.

Advice on Operations
Summary of operations which may cause deterioration or disturbance to the Severn Estuary European marine site interest features at current levels of use

Standard list of categories of operation which may cause deterioration or disturbance	**Internationally important populations of regularly occurring *Annex 1* birds**	**Internationally important populations of regularly occurring migratory species**	**Internationally important assemblage of waterfowl**
Non Toxic Contamination			
Changes in nutrient loading		✓	✓
Changes in organic loading		✓	✓
Changes in thermal regime			
Physical damage			✓
Abrasion			✓
Selective extraction			
Toxic contamination	✓	✓	✓
Introduction of synthetic compounds			
Introduction of non-synthetic compounds	✓	✓	✓
Introduction of radionuclides	✓	✓	✓

SCREENING

3 **Is the proposal directly connected with, or necessary to, conservation management of the designated Natura site?**
No.

4 **Consider whether there are any likely direct, indirect or secondary impacts of the project on the designated Natura site**
No – site over 20 km from the County boundary therefore no impacts from dry deposition of nitrogen or acid are expected.

5 **Consider the key phases of development and the risk of effects associated with each.**
N/A

6 **Appraise which individual elements of the overall project would give rise to the greatest risk of effects. State any element of the project where the scale or magnitude of effect is not known**
N/A

7 **Is the plan/project likely to have a significant effect on Severn Estuary cSAC, SPA and Ramsar either alone or in combination, with other plans or projects?**
No

Annex B

Consideration of In-Combination Effects

Table 1.1 Consideration of In Combination Effects

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
Lyppard Grange Ponds SAC (1.09 ha)	Great Crested Newt population. *Associated BAP habitat categories:* Lowland Ponds and Neutral grassland/parkland.	• Water quality - eutrophication is a threat from surface run-off or groundwater pollution and atmospheric deposition. • Water levels – a high and stable water table is fundamental, any further nearby development could threaten this. • Introduction of fish, threats from adjacent residential area. • Scrub or tree encroachment (leading to shading, nutrient and hydrological effects). • Spread of introduced non-native species. • Recreational pressure / disturbance. • Development pressure. • Diffuse air pollution.	Relevant local plans and projects: • Bosch development, relocation of premises to Worcester Industrial Park off J6 of the M6 – Increase in traffic pollution. Phase 1 of the development could start in 2012. • Football Stadium and mixed development, St Modwen Developments Ltd to the east of Nunnery Way next to the M5. Disturbance Effects: Impacts could potentially arise from direct disturbance as a result of increase human presence following residential expansion from the proposals listed above. .	Worcester • Central (3,200) • Outskirts (3,500) • Adjacent to Kilbury Drive (300) • St Peters (300) Fernhill Heath (500) Droitwich Spa (1,200) Malvern • Newland (1,100) • Central Malvern (500) • Upton upon Severn (50) • Tunnel Hill (50) Pershore • North of Station Road (400)	No	Yes

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
			Air Dispersion Effects: Possible impacts could also arise from air pollution dispersion effects on woodland habitat communities for which the violet click beetle is directly dependent	• North east of Wyre Road (400) • Three Springs Road (150) Bromsgrove • Bromsgrove District Council (2,100) • Longbridge Area Action Plan - min. of 700 homes Redditch • Redditch District Council (6,600)- town centre 3300, north of centre 3300		
Bredon Hill SAC (359.86)	*Limoniscus violaceus* (Violet Click Beetle) - ancient ash pollards (for breeding) *Associated BAP habitat:* Broadleaved, mixed and yew woodland	• Integrity depends primarily on appropriate woodland management to maintain sufficient proportion of mature trees and decaying wood for the violet click beetle. • Atmospheric pollution (nutrient deposition and acidification,	Relevant local plans and projects: • 'Middle Quinton' Ecotown – possible increase in recreational pressure. Disturbance Effects: Impacts could potentially arise from	Evesham • Offenham Road – 1,500 • Hampton – 800 • Proposed New Eco -Town Site Pershore • North of Station	No	Yes

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
	and lowland parkland and wood pasture.	potential for successional habitat change and deterioration and reduction in number of suitable pollards. • Water level – maintenance of water table potential draining of damp habitat affecting quality of woodland and pollards. • Heavy recreational pressure – increased disturbance to key invertebrate habitat. • Development pressure– increased disturbance to key invertebrate habitat. • Scrub encroachment – swamping key invertebrate habitat and change in habitat structure.	direct disturbance as a result of increase human presence following residential expansion from the proposals listed above. Air Dispersion Effects: Possible impacts could also arise from air pollution dispersion effects on woodland habitat communities for which the violet click beetle is directly dependent. However, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and in combination effects from air dispersion are considered unlikely.	Road (400) • North east of Wyre Road (400) • Three Springs Road (150) Malvern • Newland (1,100) • Central Malvern (500) • Upton upon Severn (50) • Tunnel Hill (50) Direct disturbance from any expansion of these areas is possible.		
Dixton Wood SAC (13.14 ha)	*Limoniscus violaceus* (Violet Click Beetle)	• Integrity depends primarily on appropriate woodland management to maintain sufficient proportion of mature trees and decaying wood for the violet click beetle. • Atmospheric pollution (nutrient deposition and acidification, potential for successional habitat	Relevant local plans and projects: • 'Middle Quinton' Ecotown – possible increase in recreational pressure. Disturbance Effects: Impacts could potentially arise from direct disturbance as a result of increase	Evesham • Offenham Road – 1,500 • Hampton - 800 • Proposed New Eco -Town Site Direct disturbance from any expansion	No	Yes

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
		change and deterioration and reduction in number of suitable pollards. • Water level – maintenance of water table potential draining of damp habitat affecting quality of woodland and pollards. • Heavy recreational pressure – increased disturbance to key invertebrate habitat. • Development pressure– increased disturbance to key invertebrate habitat. • Scrub encroachment – swamping key invertebrate habitat and change in habitat structure.	human presence following residential expansion from the proposals listed above. Air Dispersion Effects: Possible impacts could also arise from air pollution dispersion effects on woodland habitat communities for which the violet click beetle is directly dependent. However, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and in combination effects from air dispersion are considered unlikely.	of these areas is possible.		
Fens Pools SAC (20.4 ha)	Great Crested Newt population. *Associated BAP habitat categories:* Lowland Ponds and Neutral grassland/parkland.	• Water quality - eutrophication is a threat from surface run-off or groundwater pollution and atmospheric deposition. • Water levels – a high and stable water table is fundamental, any further nearby development could threaten this. • Introduction of fish, threats from adjacent residential area.	Direct Disturbance Effects: No direct disturbance impacts to the hydrology of the SAC or to the populations of great crested newt are likely to arise from local plans and projects. Air Dispersion Effects:	Kidderminster: • Wyre Forest District Council - 3,400 housing growth • West Hagley Direct disturbance from any expansion of these areas is	Yes	No

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
		• Scrub or tree encroachment (leading to shading, nutrient and hydrological effects). • Spread of introduced non-native species. • Recreational pressure / disturbance. • Development pressure. • Diffuse air pollution.	The only possible impacts will arise from air pollution dispersion effects on riparian habitat communities, however these habitats are not part of the reasons for SAC designation. Furthermore, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely.	unlikely.		
River Wye / Afon Gwy SAC (2234.89 ha)	Habitats: Water courses with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Species: *Austropotamobius pallipes* (White-clawed crayfish) *Petromyzon marinus* (Sea lamprey) *Lampetra planeri* (Brook lamprey) *Lampetra fluviatilis* (River lamprey)	• Water quality – pollution through agricultural run-off and sewage outputs is a problem. • Flow (flow regime should be characteristic of the river). Abstraction should be regulated. • Suspended sediments/siltation – through intensification of agricultural practices and other disturbance eg soil degradation around stock feeding points. • Inappropriate dredging. • Recreational pressure and disturbance – can lead to disturbance, damage and	Direct Disturbance Effects: No direct disturbance impacts to the hydrology of the SAC are likely to arise from local plans and projects. Air Dispersion Effects: The only possible impacts will arise from air pollution dispersion effects on riparian habitat communities which may in turn affect the species for which the river is designated. Furthermore, no significant proposals for	None	No	Yes

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
	Alosa fallax (Twaite shad) *Salmo salar* (Atlantic salmon) *Cottus gobio* (Bullhead) *Lutra lutra* (Otter)	increases in suspended sediment eg footpath erosion, water-based activities. • Atmospheric pollution - deposition of oxides of nitrogen & sulphur, acidification of river water (deposition of nitrogen & ammonia). • Climate change - change in rainfall patterns and transpiration rates, inc temp – more algal blooms, reduced summer flow. Inc high rainfall – more erosive runoff and sedimentation. • Illegal fish poaching. • Spread of introduced non-native species. • Artificial barriers to fish migration.	industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely.			
Walmore Common SPA (52.85 ha)	Supports population of - Over winter: *Cygnus columbianus bewickii* (Bewick's swan)	• Disturbance to wintering bird population and supporting habitats. • Maintenance of appropriate grazing regime. • Water level – maintenance of hydrological regime (grassland communities are strongly	Direct Disturbance Effects: No direct disturbance impacts are likely to arise from local plans and projects. Air Pollution Effects: Impacts arising from air pollution	Malvern • Newland (1,100) • Central Malvern (500) • Upton upon Severn (50) • Tunnel Hill (50)	Yes	No

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
		influenced by the quantity and base status of the groundwater). • Water quality – nutrient enrichment from fertiliser run-off etc. • Scrub encroachment (often due to undergrazing). • Development pressure. • Spread of introduced non-native species. • Human disturbance (off-road vehicles, burning (vandalism)). • Atmospheric pollution eg nitrous oxides from vehicle exhausts.	dispersion effects on wet grassland communities are possible. However, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely.	Direct disturbance from any expansion of these areas are unlikely.		
Walmore Common Ramsar	International important population of - Over winter: *Cygnus columbianus bewickii* (Bewick's swan)	• Disturbance to wintering bird assemblage and associated wetland habitats. • Maintenance of appropriate grazing regime. • Water level – maintenance of hydrological regime (grassland communities are strongly influenced by the quantity and	Direct Disturbance Effects: No direct disturbance impacts are likely to arise from local plans and projects. Air Pollution Effects: Impacts arising from air pollution dispersion effects on wet grassland	Malvern • Newland (1,100) • Central Malvern (500) • Upton upon Severn (50) Direct disturbance from any expansion	Yes	No

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
		base status of the groundwater). • Water quality – nutrient enrichment from fertiliser run-off etc. • Scrub encroachment (often due to undergrazing). • Development pressure. • Spread of introduced non-native species. • Human disturbance (off-road vehicles, burning (vandalism)). • Atmospheric pollution eg nitrous oxides from vehicle exhausts.	communities are possible. However, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely	of these areas are unlikely.		
Severn Esturary cSAC (73,715.4 ha)	Habitats: Estuaries Mudflats and sandflats Saltmarsh Species: *Petromyzon marinus* (Sea lamprey) *Lampetra fluviatilis*	• Water quality – pollution through agricultural run-off and sewage outputs is a problem. • Flow (flow regime should be characteristic of the river). Abstraction should be regulated. • Suspended sediments/siltation – through intensification of agricultural practices and other	Direct Disturbance Effects: No direct disturbance impacts are likely to arise from local plans and projects. Air Dispersion Effects: Impacts arising from air pollution dispersion effects on saltmarsh	None	Yes	No

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
	(River lamprey) *Alosa fallax* (Twaite shad)	disturbance eg soil degradation around stock feeding points. • Inappropriate dredging. • Recreational pressure and disturbance – can lead to disturbance, damage and increases in suspended sediment eg footpath erosion, water-based activities. • Atmospheric pollution - deposition of oxides of nitrogen & sulphur, acidification of river water (deposition of nitrogen & ammonia). • Climate change - change in rainfall patterns and transpiration rates, inc temp – more algal blooms, reduced summer flow. Inc high rainfall – more erosive runoff and sedimentation. • Illegal fish poaching. • Spread of introduced non-native species. • Artificial barriers to fish migration.	communities are unlikely given the County is over 20 km from the cSAC. Furthermore, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely.			
Severn Estuary	Supports populations of -	• Disturbance to wintering and migratory and their supporting	Direct Disturbance Effects:	None	Yes	No

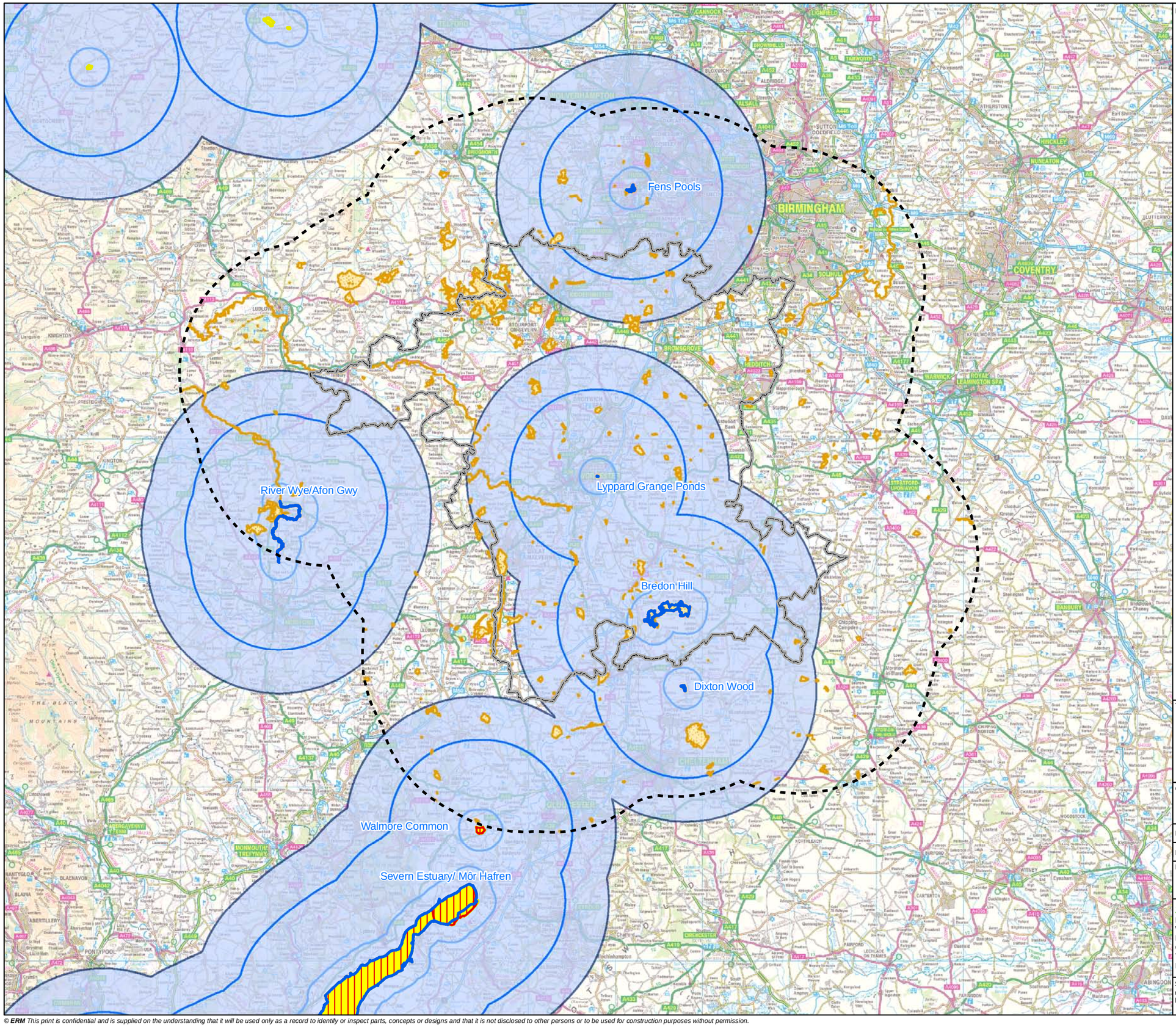
European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
SPA	Over winter: *Cygnus columbianus bewickii* (Bewick's swan) On passage: *Charadrius hiaticula* (Ringed plover) Over winter: *Numenius arquata* (Curlew) *Calidris alpina alpina* (Dunlin) *Anas acuta* (Pintail) *Tringa totanus* (Redshank) *Tadorna tadorna* (Shelduck)	habitats. • Water quality – pollution through agricultural run-off and sewage outputs is a problem. • Flow (flow regime should be characteristic of the river). Abstraction should be regulated. • Suspended sediments/siltation – through intensification of agricultural practices and other disturbance eg soil degradation around stock feeding points. • Inappropriate dredging. • Recreational pressure and disturbance – can lead to disturbance, damage and increases in suspended sediment eg footpath erosion, water-based activities. • Atmospheric pollution - deposition of oxides of nitrogen & sulphur, acidification of river water (deposition of nitrogen & ammonia). • Climate change - change in rainfall patterns and transpiration rates, inc temp – more algal blooms, reduced summer flow.	No direct disturbance impacts are likely to arise from local plans and projects. Air Dispersion Effects: Impacts arising from air pollution dispersion effects on saltmarsh communities are unlikely given the County is over 20 km from the SPA. Furthermore, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely.			

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
		Inc high rainfall – more erosive runoff and sedimentation. • Illegal fish poaching. • Spread of introduced non-native species. • Artificial barriers to fish migration.				
Severn Esutary Ramsar	Regularly supports an assemblage of at least 20,000 waterfowl	• Disturbance to bird assemblage and associated wetland habitats. • Water quality – pollution through agricultural run-off and sewage outputs is a problem. • Flow (flow regime should be characteristic of the river). Abstraction should be regulated. • Suspended sediments/siltation – through intensification of agricultural practices and other disturbance eg soil degradation around stock feeding points. • Inappropriate dredging. • Recreational pressure and disturbance – can lead to disturbance, damage and increases in suspended sediment eg footpath erosion, water-based activities.	Direct Disturbance Effects: No direct disturbance impacts are likely to arise from local plans and projects. Air Dispersion Effects: Impacts arising from air pollution dispersion effects on saltmarsh communities are unlikely given the County is over 20 km from the Ramsar site. Furthermore, no significant proposals for industrial development involving emitting stacks are promoted in Worcestershire and therefore in combination effects from air dispersion are considered unlikely.	None	Yes	No

European site	cSAC designated interest features	Vulnerabilities and potential adverse effects related to the conservation objectives for the site	Potential impacts upon qualifying features arising from local plans and projects	Broad urban areas with possible in combination effects from housing growth * (proposed house numbers are in brackets)	Can the likelihood of a significant effect resulting from other plans and projects be ruled out at this stage?	Is there a risk of in-combination effects?
		• Atmospheric pollution - deposition of oxides of nitrogen & sulphur, acidification of river water (deposition of nitrogen & ammonia). • Climate change - change in rainfall patterns and transpiration rates, inc temp – more algal blooms, reduced summer flow. Inc high rainfall – more erosive runoff and sedimentation. • Illegal fish poaching. • Spread of introduced non-native species. • Artificial barriers to fish migration.				

* See *District Core Strategy Preferred Options for Housing Growth for 2006 -2026 Map*

Figures



KEY:

- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- 2km Buffer from European Site
- 10km Buffer from European Site
- 15km Buffer from European Site
- SSSI
- RAMSAR
- SPA

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Kilometres

TITLE:

Figure 1
2, 10 and 15km Buffer of Designated Sites

CLIENT:	SIZE:
Worcestershire County Council	A3

DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar

DRAWING:	REV:
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Facsimile: 01865 204982

ERM

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KEY:

- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- 1km Buffer from Special Area of Conservation
- 2km Buffer from Special Area of Conservation
- 15km Buffer from Special Area of Conservation
- SSSI

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Kilometres

TITLE:

Figure 2
1, 2 and 15km Buffer - Lyppard Grange Ponds Site

CLIENT:	SIZE:
Worcestershire County Council	A3

DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar

DRAWING:	REV:
LyppardGrangePonds_AllBuffers.mxd	0

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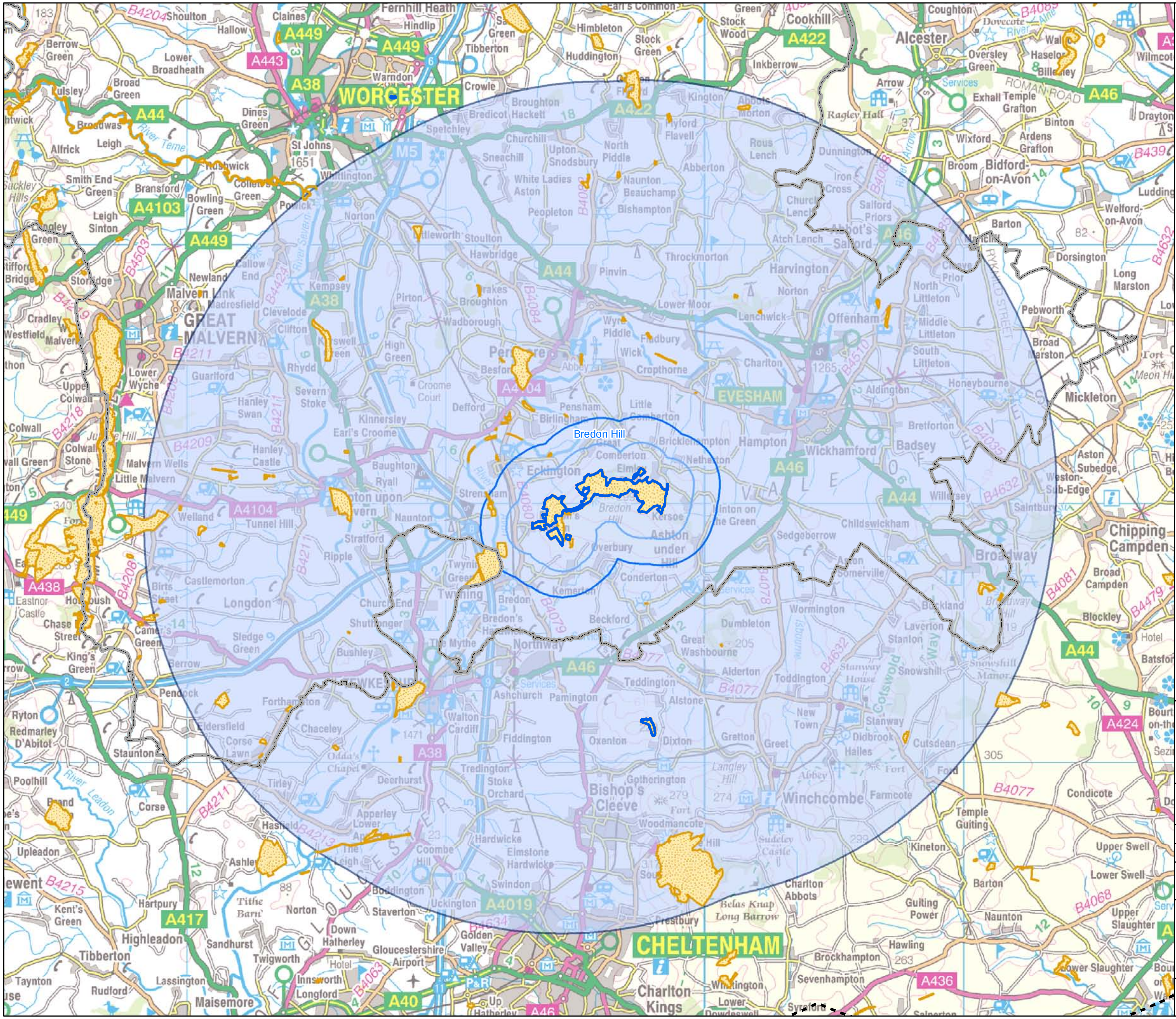
PROJECTION: British National Grid

File: 0096130\WorcestershireGIS_IG_MT\Maps\LyppardGrangePonds_ABuffers.mxd



KEY:
- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- 1km Buffer from Special Area of Conservation
- 2km Buffer from Special Area of Conservation
- 15km Buffer from Special Area of Conservation
- SSSI

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TITLE:
Figure 3
1, 2 and 15km Buffer - Bredon Hill Site

CLIENT: Worcestershire County Council		SIZE: A3
DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar
DRAWING: BredonHill_AllBuffers.mxd		REV: 0

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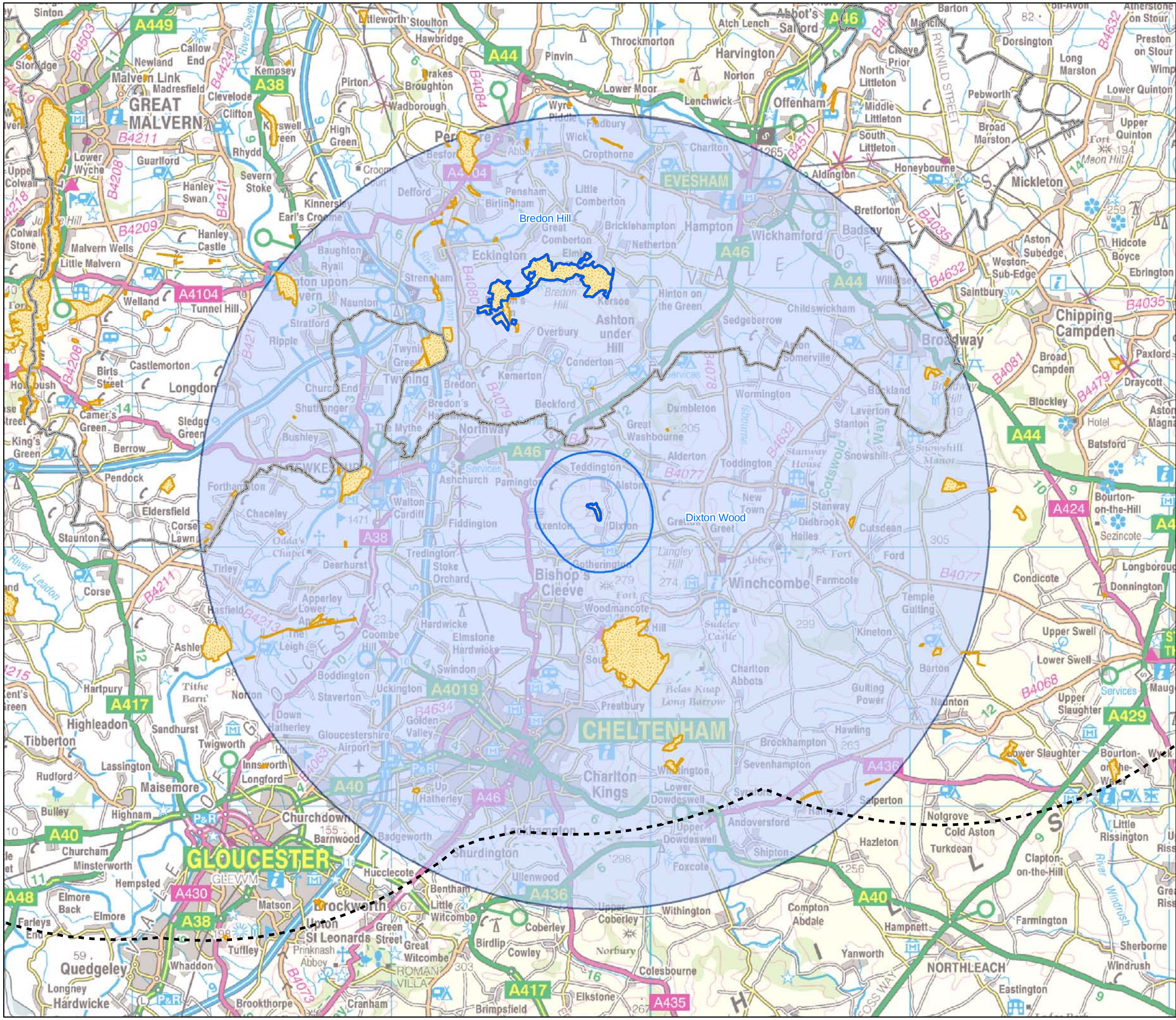
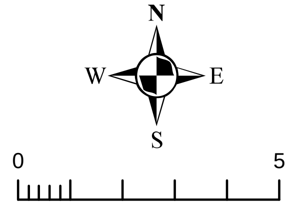


KEY:

- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- 1km Buffer from Special Area of Conservation
- 2km Buffer from Special Area of Conservation
- 15km Buffer from Special Area of Conservation
- SSSI



TITLE:

Figure 4
1, 2 and 15km Buffer - Dixton Wood Site

CLIENT: Worcestershire County Council		SIZE: A3
DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar
DRAWING: DixtonWood_AllBuffers.mxd		REV: 0

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PROJECTION: British National Grid

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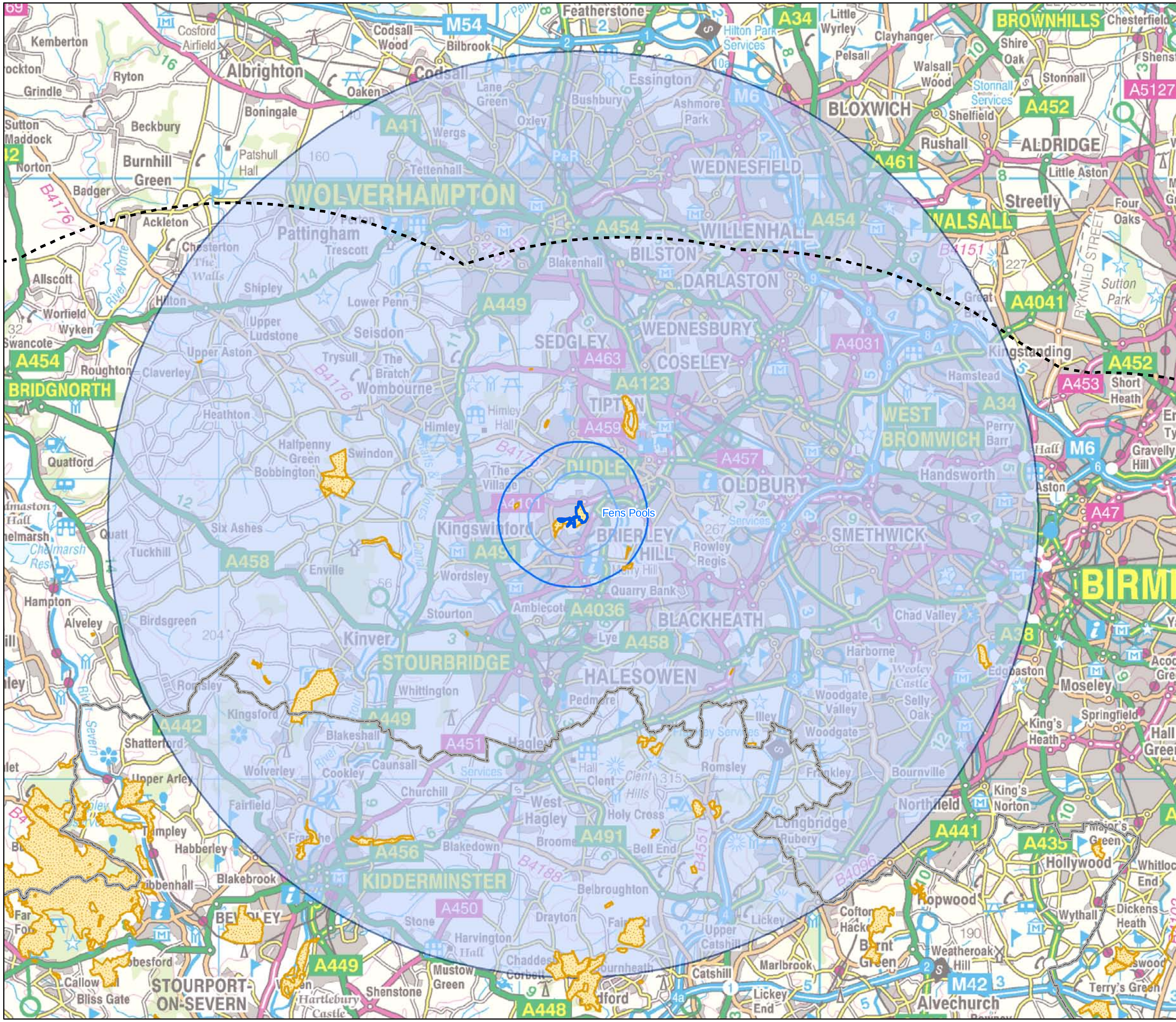

KEY:

- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- 1km Buffer from Special Area of Conservation
- 2km Buffer from Special Area of Conservation
- 15km Buffer from Special Area of Conservation
- SSSI

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Kilometres

TITLE:
Figure 5
1, 2 and 15km Buffer - Fens Pools Site

CLIENT: Worcestershire County Council		SIZE: A3
DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar
DRAWING: FensPools_AllBuffers.mxd		REV: 0

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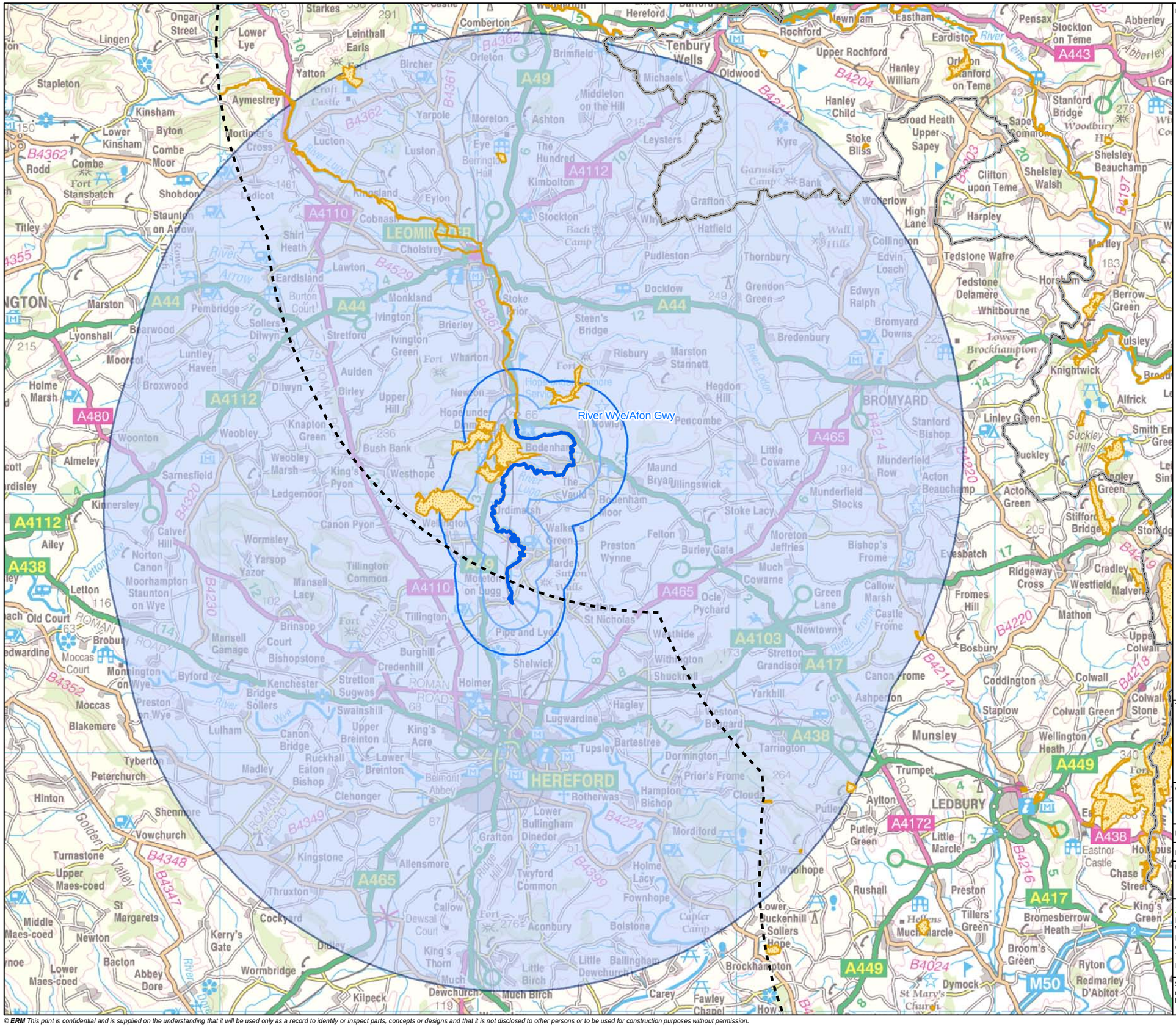

KEY:

- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- 1km Buffer from Special Area of Conservation
- 2km Buffer from Special Area of Conservation
- 15km Buffer from Special Area of Conservation
- SSSI

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Kilometres

TITLE:

Figure 6
1, 2 and 15km Buffer - River Wye / Afon Gwy Site

CLIENT:	SIZE:
Worcestershire County Council	A3

DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar

DRAWING:	REV:
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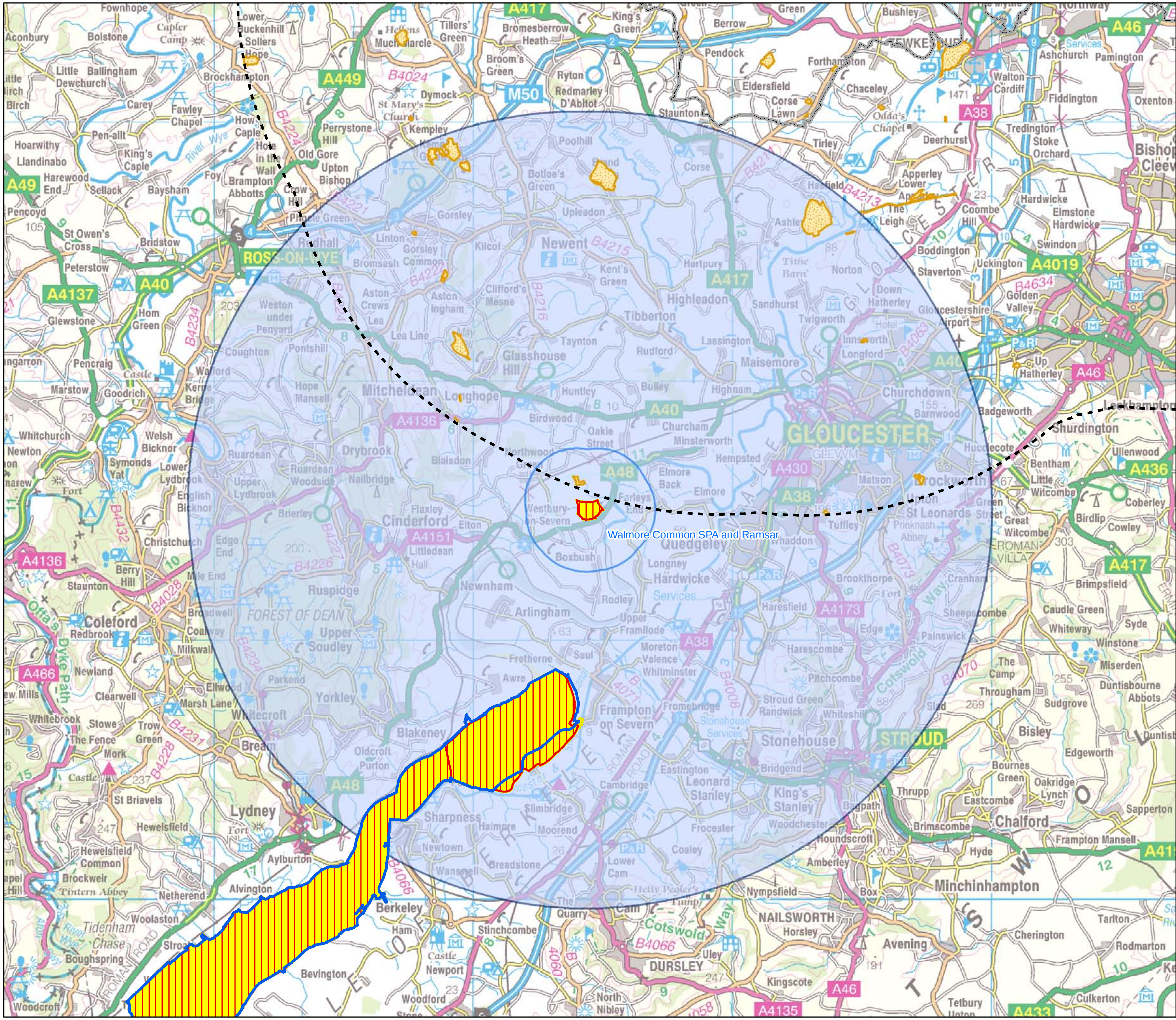

KEY:

- Worcestershire County Boundary
- 15km from Worcestershire Border
- Special Area of Conservation
- RAMSAR
- SPA
- 15 km Buffer from SPA and Ramsar
- 2 km Buffer from SPA and Ramsar
- 1 km Buffer from SPA and Ramsar
- SSSI

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Kilometres

TITLE:
Figure 7
1, 2 and 15km Buffer - Walmore Common Site

CLIENT: Worcestershire County Council		SIZE: A3
DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
DRAWN: CO	APPROVED:	SCALE: As Scale Bar
DRAWING: Walmore_AllBuffers.mxd		REV: 0

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File: 0096130WorcestershireGIS_IG_MTWMaps\Walmore_AllBuffers.mxd

KEY:

Worcestershire County Boundary

Areas proposed for the consideration of site allocations where no likely significant effect is concluded

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Kilometres

TITLE:

Figure 8
HRSA Findings

CLIENT:	SIZE:
Worcestershire County Council	A3

DATE: 19/06/2009	CHECKED: PB	PROJECT: 0096130
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DRAWING:	REV:
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