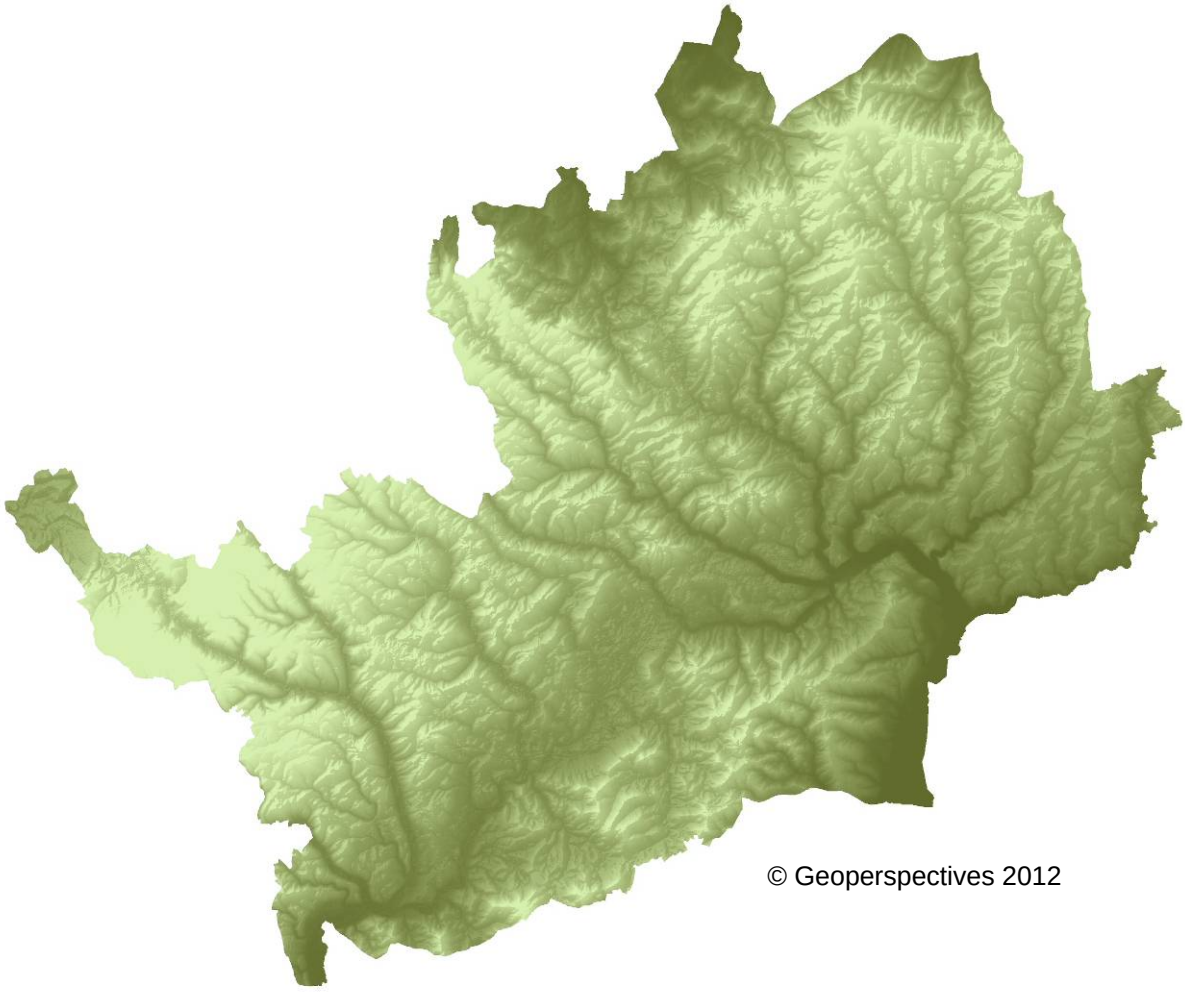
LOCAL FLOOD RISK MANAGEMENT STRATEGY FOR HERTFORDSHIRE

Habitats Regulations Assessment
Scoping & Screening Report

June 2012



Hertfordshire

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Executive Summary

A Habitats Regulations Assessment of the Local Flood Risk Management Strategy for Hertfordshire (LFRMS) has been carried out by Hertfordshire County Council.

This assessment has identified appropriate control measures which will be incorporated into LFRMS to ensure that, once implemented, the Strategy will not have a significant effect on any European site.

It is concluded that the LFRMS is not likely to have any significant negative effects on any European sites, alone or in combination with other plans or projects. Given this conclusion, there is no requirement to progress to the next stage of the Habitats Regulations assessment (an 'appropriate assessment' to examine the question of adverse effect on the integrity of European sites).

This conclusion does not remove the need for later Habitats Regulations assessment of any other plans, projects, or permissions associated with, or arising out of, the measures identified in the Plan. Acceptance that this Plan is consistent, so far as can be ascertained, with the Habitats Regulations does not guarantee that any plan or project derived from the Plan will also be found consistent.

1. Introduction

This assessment considers if the Local Flood Risk Management Strategy for Hertfordshire (LFRMS) is likely to have a significant effect on any European sites. This is a distinct step separate from an 'Appropriate Assessment' which is to establish whether a plan will have an adverse effect on the integrity of a European site.

2. About the Habitats Regulations Assessment

EC Directive (92/43/EEC) on the Conservation of natural habitats and of wild flora and fauna ('Habitats Directive') is implemented (with the Birds Directive (79/409/EEC)) in the UK as 'The Conservation (Natural Habitats, &c.) Regulations 1994'. This legislation provides the legal framework for the protection of habitats and species of European importance. Article 6(3) of the Habitats Directive sets out the decision-making tests for plans and projects likely to affect Special Areas of Conservation (SACs) and Special Protection Areas (SPAs); collectively these sites are referred to as Natura 2000 sites, this being that:

> *Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the sites conservation objectives.*

This applies to all SACs and SPAs, including candidate SACs and Sites of Community Importance (SCI). As a matter of national policy this approach is also being applied to potential SPAs and designated Ramsar sites. Collectively these sites will be referred to as 'European sites' for the purposes of this assessment.

The assessment is underpinned by the precautionary principle, especially in the assessment of potential impacts and their resolution. If it is not possible to rule out the risk of harm on the evidence available then it is assumed that a risk may exist and it needs to be dealt with in the assessment process, preferably through changes to the proposed measure or through options such as avoidance or control measures. If this is not possible the plan will be subject to an 'Appropriate Assessment'.

3. The Strategy

3.1 Legislative Requirements

Section 9 in Part 1(2) of the Flood and Water Management Act 2010 defines the scope of Local flood risk management strategies in England. This being:

(1) A lead local flood authority for an area in England must develop, maintain, apply and monitor a strategy for local flood risk management in its area (a “local flood risk management strategy”).

(2) In subsection (1) “local flood risk” means flood risk from:

(a) surface runoff,
(b) groundwater, and
(c) ordinary watercourses.

(3) In subsection (2)(c) the reference to an ordinary watercourse includes a reference to a lake, pond or other area of water which flows into an ordinary watercourse.

(4) The strategy must specify:

(a) the risk management authorities in the authority's area,
(b) the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area,
(c) the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009),
(d) the measures proposed to achieve those objectives,
(e) how and when the measures are expected to be implemented,
(f) the costs and benefits of those measures, and how they are to be paid for,
(g) the assessment of local flood risk for the purpose of the strategy,
(h) how and when the strategy is to be reviewed, and
(i) how the strategy contributes to the achievement of wider environmental objectives.

(5) The strategy must be consistent with the national flood and coastal erosion risk management strategy for England under section 7.

(6) A lead local flood authority must consult the following about its local flood risk management strategy:

(a) risk management authorities that may be affected by the strategy (including risk management authorities in Wales), and
(b) the public.

(7) A lead local flood authority must publish a summary of its local flood risk management strategy (including guidance about the availability of relevant information).

(8) A lead local flood authority may issue guidance about the application of the local flood risk management strategy in its area.

(9) A lead local flood authority must have regard to any guidance issued by the Secretary of State about:

(a) the local flood risk management strategy, and
(b) guidance under subsection (8).

3.2 Policies of the Lead Local Flood Authority Included in the Strategy

The LFRMS contains six policies relating to the activities to be undertaken by the lead local flood authority. These polices are as follows:

3.2.1 POLICY 1. Role of Lead Local Flood Authority

The county council will seek to develop an inclusive and collaborative approach to the sustainable management of local flood risk in Hertfordshire through:-

- a proportionate and risk based approach;
- working in partnership locally and more widely as appropriate;
- publication of criteria on which decisions are based;
- community focus;
- where possible making information freely available; and
- opportunities for additional benefits (sustainability, environment)

3.2.2 POLICY 2. Investigation and Reporting of Flood Events

Flood events reported to the county council will be recorded and where necessary appropriately investigated in line with the criteria set out in the procedure “Recording and Investigation of Flood Events”.

3.2.3 POLICY 3. Register of Structures and Features

Any structure or feature that has a significant effect on local flood risk will be placed on the public register. The determination of structures and features to be placed on the register will be made by the Lead Local Flood Authority in consultation with the relevant risk management authorities and the structure or feature’s owner.

3.2.4 POLICY 4. Consenting and Enforcement Activities Relating to Ordinary Watercourses

The county council will operate a risk based approach to the consenting and enforcement activities relating to ordinary watercourses. Where required activity will be coordinated with

- district councils as they have statutory functions relating to development control and management of ordinary watercourses
- the Environment Agency as they have a statutory functions relating to pollution and water resources
- Natural England as they have statutory functions relating to species habitats and protected sites
- other relevant bodies where there are consequences for regulated functions such as highways and historic environment

3.2.5 POLICY 5. Sustainable Drainage (SuDS) Approval Body

Hertfordshire County Council as Lead Local Flood Authority is required to determine the arrangements for surface water drainage schemes linked to new development. When setting up the guidelines under which the SuDS Approval Body will operate Hertfordshire County Council will work with the district planning authorities to ensure that any relevant SuDS will, in addition to meeting the requirements under the National Standards, as far as it practically possible, make a contribution to local amenity and environment appropriate to the locality in Hertfordshire.

3.2.6 POLICY 6. Designation of Structures and Features

Hertfordshire County Council will work with the Risk Management Authorities to develop and keep under review criteria and a protocol for the designation of third party structures and features which are deemed to have a significant effect on local flood risk.

4. Habitats Regulations Assessment

4.1 Identification of Relevant Sites

Assessment under the Habitats Regulations requires consideration of all European sites that have potential to be impacted by the plan. The detail, including location, of many of the measures in the plan will not be developed until the measures progress towards implementation. It has been assumed that any of the measures could potentially be implemented anywhere within Hertfordshire.

The effects of a plan are not necessarily confined to European sites lying within the plan boundary. The assessment identifies all sites within or near the plan boundary and will cover those that could be impacted so this will capture any potential river catchment and downstream effects. All European sites within or near Hertfordshire are listed below and their location is shown in Figure 1. Site and qualifying features for designation as well as key environmental conditions to support site integrity are identified in Table 1.

Six European sites were considered:

- Chilterns Beechwoods SAC. Hertfordshire, Buckinghamshire.
- Wormley-Hoddesdonpark Woods SAC. Hertfordshire.
- Epping Forest SAC. Essex.
- Burnham Beeches SAC. Buckinghamshire.
- Eversden and Wimpole Woods SAC. Cambridgeshire.
- Lee Valley SPA and Ramsar site. Hertfordshire, Essex, Greater London.

4.2 Potential impacts of the Local Flood Risk Management Strategy

Within the life of this strategy the management of flood risk will have two areas of activity potentially relevant to impacts on Natura 2000 sites

- Management of flood risk in currently developed areas may result in works to modify the flow of water across the land surface or in ordinary watercourses.

- Management of flood risk in areas of new development which will primarily relate to approval of arrangements for surface water drainage.

A common outcome for both instances above is that where water flowing over the surface or in ordinary watercourses is managed it will be retained in the catchment for longer. There will be some form of storage either above or below ground and then the water will be released at a controlled rate into the ground, watercourses or surface water sewers.

In the case of Sustainable Drainage Approvals (SuDS) as well as retention of water there are likely to be elements within SuDS systems that will improve water quality either through settlement, filtration or exposure to natural breakdown processes.

It is anticipated that for the majority of the affected Natura 2000 sites these impacts will not be significant due to the location and characteristics of the sites relative to where any activity will be taking place.

Figure 1 Map of Relevant Natura 2000 European Sites

Natura 2000 sites in and around Hertfordshire shown relative to an outline of the county with buffers at 5, 10 and 15km

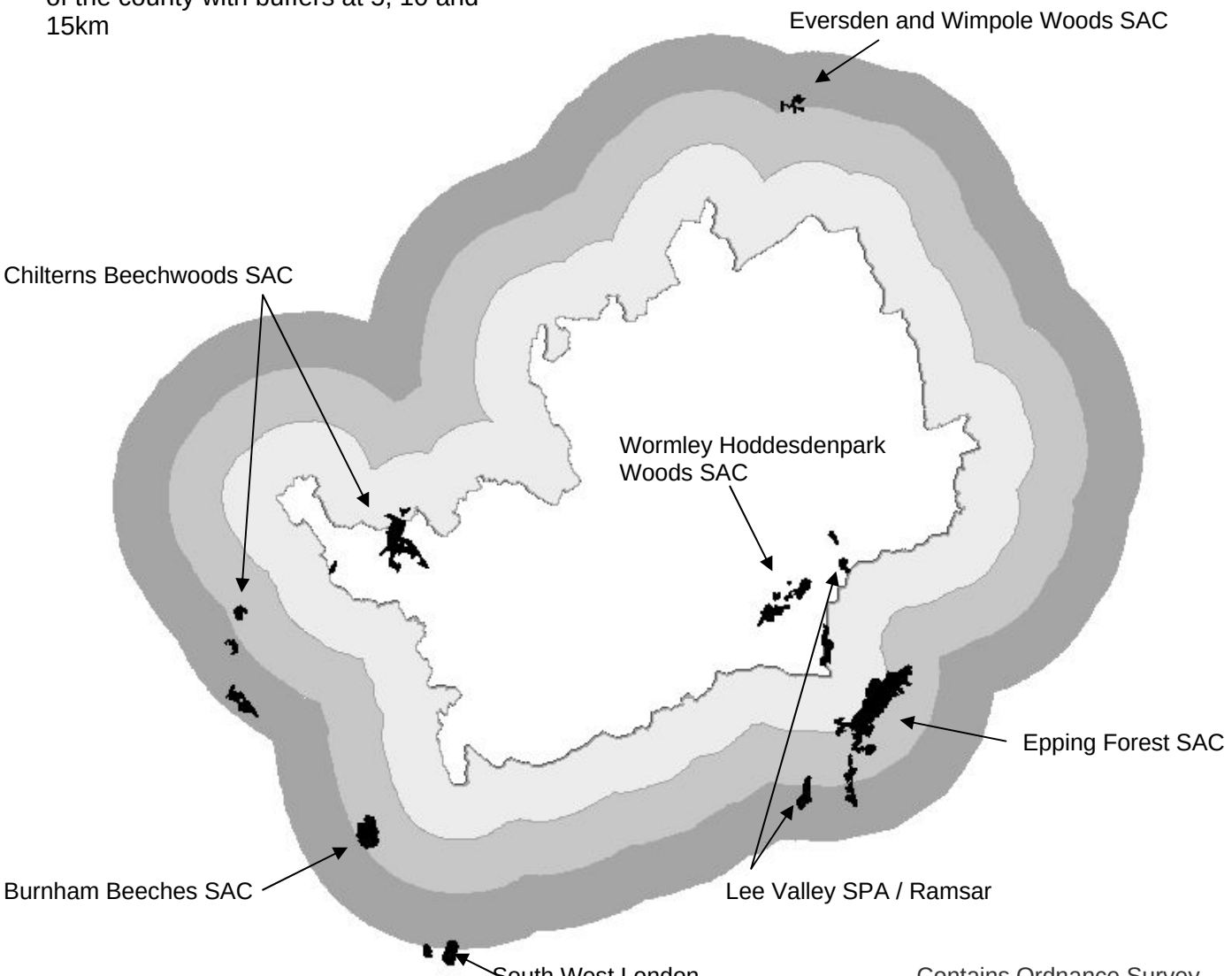

Figure 2 Map of Natura 2000 European Sites Relative to Settlements Larger than 1000 Population in Hertfordshire

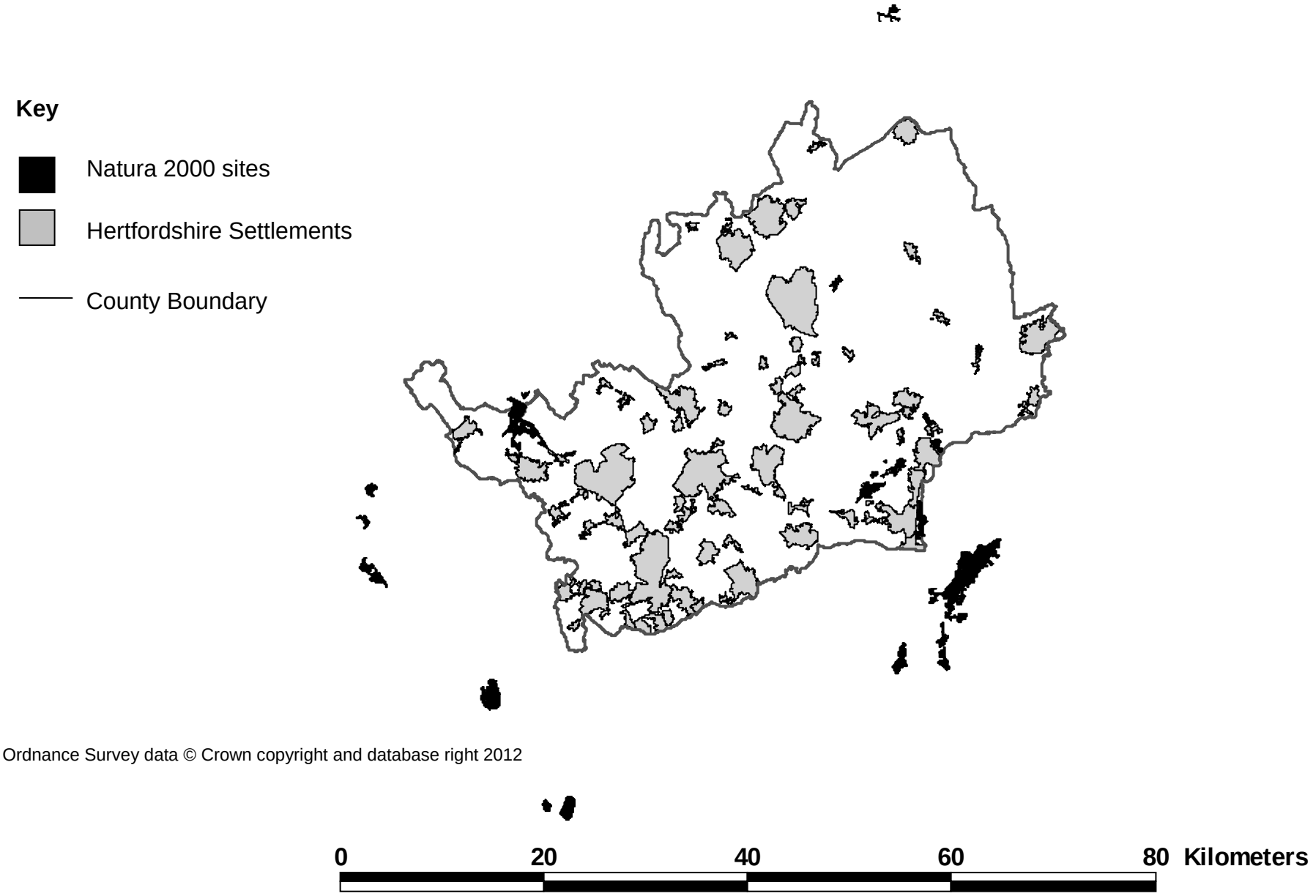

Figure 3 Map of Natura 2000 European Sites Relative to River Catchments

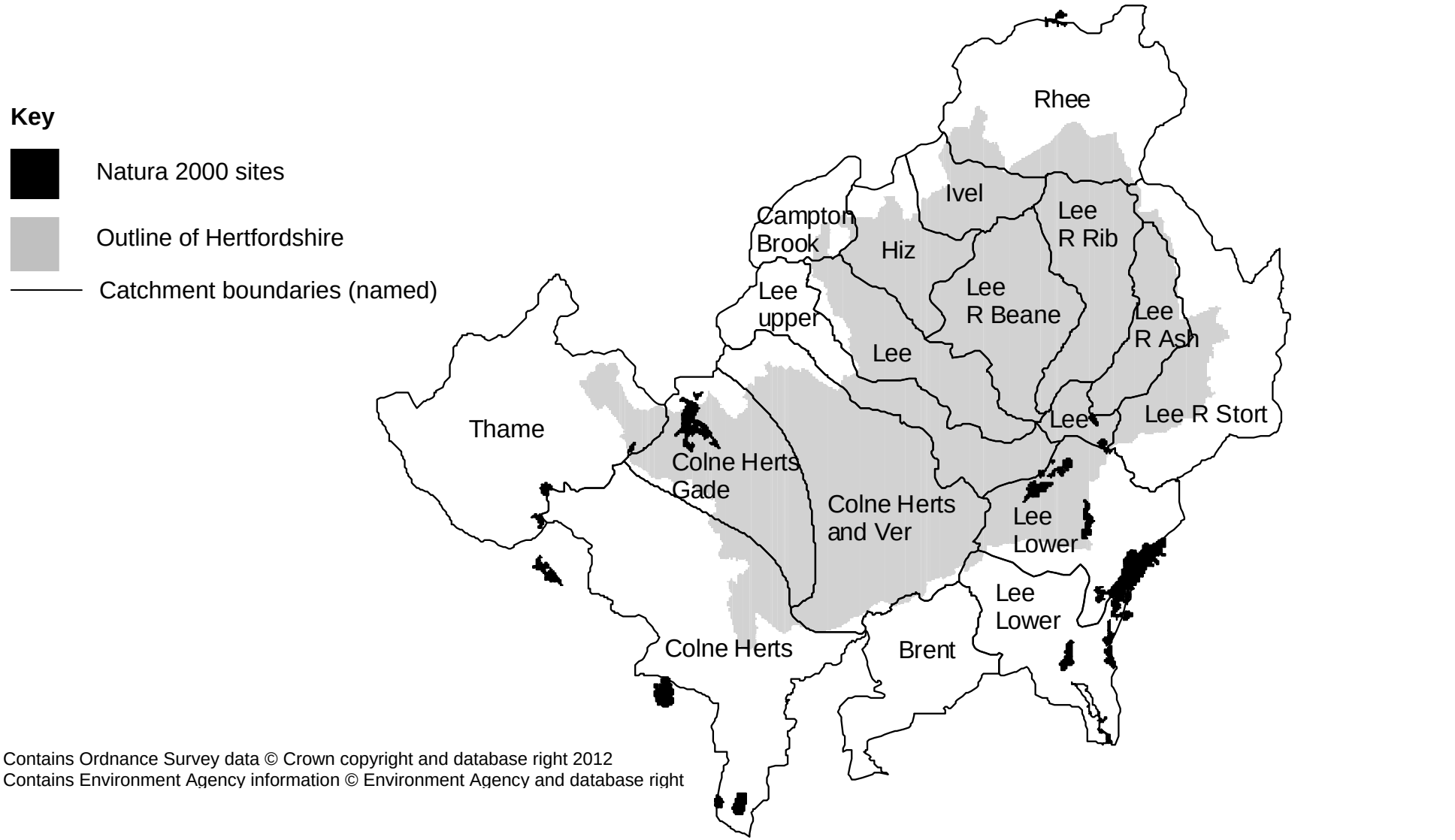

Figure 4 Map of Natura 2000 European Sites Relative to Rivers and Significant Watercourses (Main Rivers)

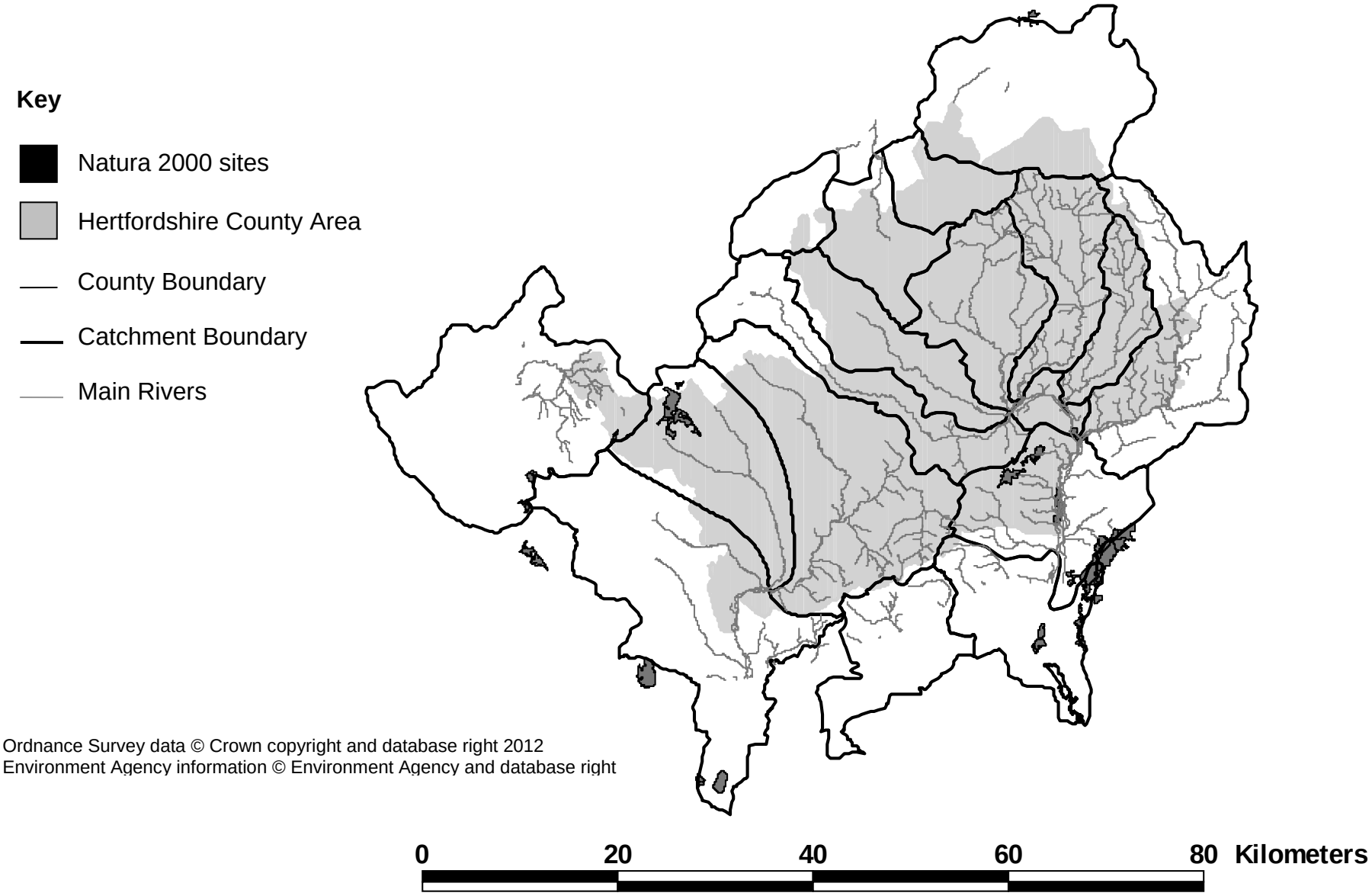

Table 1 Site and Qualifying Features for Designation and Key Environmental Conditions to Support Site Integrity, Catchment Details and Hydrological Needs

Site and qualifying features for designation	Key environmental conditions to support site integrity	Catchment	Hydrologcal needs	Potential impact of LFRMS and mitigations (if necessary)
Chilterns Beechwoods SAC. Beech woodland with a distinctive flora. Semi-natural dry grassland and scrub on calcareous soils. Presence of Stag beetle.	• No loss in the area of woodland. • Appropriate woodland management; particularly, significant changes to structure (age class) and species-diversity to promote a more natural composition. • Drought years potentially contribute to the decline of beech trees. • Appropriate management of grassland, scrub and heath. The long-term sustainability of the Juniper is uncertain due to a lack of natural regeneration and a poor ability of the species to compete with other scrub species. • Maintain the existing number of old trees and amount of dead wood for Stag beetles. • Limit air pollution. • Control recreational pressures; disturbance, soil compaction and erosion of tree-root zone.	Colne , Thame Cherwell, Thame and Wye	Site will tolerate “normal” range of weather events. Although site may be impacted by extreme natural events eg prolonged periods of water stress (possible) and prolonged periods of flooding (unlikely)	Reduction of velocity of water flow through catchments. **(no signifcant negative impact)** Water held in catchments rather than exported via waste water system. **(no significant negative impact)** Improved quality of surface water run off. **(no significant negative impact** Land take for Flood Risk Management Works **(no works in or adversely affecting Natura 2000 sites)** Majority of work driven by LFRMS will be focussed in or around large urban settlements **(no signifcant negative impact)**

Site and qualifying features for designation	Key environmental conditions to support site integrity	Catchment	Hydrologcal needs	Potential impact of LFRMS and mitigations (if necessary)
Wormley Hoddesdonpark Woods SAC. Sessile Oak-Hornbeam woodland. Bluebell, mosses and bryophytes.	• No loss in the area of woodland. • Appropriate woodland management; particularly, significant changes to structure (age class) and species-diversity to promote a more natural composition. • Removal of non-native tree species with acceptable levels of native replanting. • Identify areas of minimum intervention; areas of high forest; coppice and wood pasture. • Appropriate management of grassland (wood pasture) and heath. • Protect streams, wet flushes and bryophytes from erosion, damage and disturbance. • Limit air pollution. • Control recreational pressures; disturbance, soil compaction and erosion of tree-root zone.	Lower Lee	Site will tolerate “normal” range of weather events. Although site may be impacted by extreme natural events eg prolonged periods of water stress (possible) and prolonged periods of flooding (unlikely) Watercourses should not be subject to decreases in water volume or high velocity flows	Reduction of velocity of water flow through catchments. **(no signifcant negative impact)** Water held in catchments rather than exported via waste water system. **(no significant negative impact)** Improved quality of surface water run off. **(no significant negative impact** Land take for Flood Risk Management Works **(no works in or adversely affecting Natura 2000 sites)** Majority of work driven by LFRMS will be focussed in or around large urban settlements **(no signifcant negative impact)**
Lee Valley SPA and Ramsar site.	• Limit reduction in the extent and distribution of wetland habitats; open water, marsh, reedbed.	Upper Lee and Lower Lee	The whole area is affected by rather eutrophic water quality;	Majority of work driven by LFRMS will be focussed in or around large urban settlements **(relates to**

Site and qualifying features for designation	Key environmental conditions to support site integrity	Catchment	Hydrologcal needs	Potential impact of LFRMS and mitigations (if necessary)
Component SSSI; Rye Meads, Amwell, Turnford and Cheshunt Pits, Walthamstow Reservoirs. Bittern; circa 6% of wintering population in Great Britain. Gadwall (1.7%) and Shoveler (1.9%); wintering numbers of European importance.	• Maintain water levels and manage flood events to provide extensive shallow, marginal water levels as feeding areas for Bittern and wintering wildfowl. • Maintain water quality and guard against pollution events. • Maintain sufficient food availability; small fish species, amphibians, invertebrates and appropriate species of aquatic vegetation. • Manage natural processes to maintain the extent of key habitats; expand areas where appropriate. • Control invasive, alien species. • Manage public disturbance of wintering birds during the period October-March inclusive.		There is also a potential problem from over-extraction of surface water for public supply, particularly during periods of drought. (Thames Water WRMP) Maintain water levels and maintain (improve) water quality (address eutrophication)	**impacts and mitigations below)** Reduction of velocity of water flow through catchments. **(no signifcant negative impact)** Water held in catchments rather than exported via waste water system. **(no significant negative impact)** Improved quality of surface water run off. **(no significant negative impact** Land take for Flood Risk Management Works **(no works in or adversely affecting Natura 2000 sites)**
Epping Forest SAC. Beech woodland; with veteran trees and pollards.	• No loss in the area of woodland. • Drought years potentially contribute to the decline of beech trees. • Appropriate woodland management; to promote a more natural composition.	Roding Beam and Ingrebourne	Site will tolerate “normal” range of weather events. Although site may be impacted by extreme	Reduction of velocity of water flow through catchments. Water held in catchments rather than exported via waste water system.

Site and qualifying features for designation	Key environmental conditions to support site integrity	Catchment	Hydrologcal needs	Potential impact of LFRMS and mitigations (if necessary)
Wet and dry heaths. Stag beetle; Red Data Book and Nationally Scarce invertebrates.	• Appropriate management of grassland, scrub and heathland communities. • Maintain the existing number of old trees and pollards, and dead wood for Stag beetles. • Control non-native species; eg. rhododendron, Turkey oak and sycamore. • Limit air pollution. • Control recreational pressures; disturbance, soil compaction and erosion of tree-root zone.		natural events prolonged periods of water stress (possible) and prolonged periods of flooding (unlikely).	Improved quality of surface water run off. **(no significant negative impact as work in Hertfordshire not connected to this catchment)** Land take for Flood Risk Management Works Majority of work driven by LFRMS will be focussed in or around large urban settlements **(no signifcant negative impact as site is outside the geographical scope of this strategy)**
Burnham Beeches SAC. Beech woodland with many old pollards. Saproxylic invertebrates 14 Red Data Book	• No loss in the area of woodland. • Drought years potentially contribute to the decline of beech trees. • Appropriate woodland management; to promote a more natural composition. • Maintain the existing number of old trees and pollards for invertebrates. • Limit air pollution.	Thames Maidenhead to Sunbury	Site will tolerate “normal” range of weather events. Although site may be impacted by extreme natural events eg prolonged periods of water stress (possible)	Reduction of velocity of water flow through catchments. Water held in catchments rather than exported via waste water system. Improved quality of surface water run off.

Site and qualifying features for designation	Key environmental conditions to support site integrity	Catchment	Hydrologcal needs	Potential impact of LFRMS and mitigations (if necessary)
species. Nationally important epiphytic communities.	• Control recreational pressures; disturbance, soil compaction and erosion of tree-root zone.		and prolonged periods of flooding (unlikely)	**(no significant negative impact as work in Hertfordshire not connected to this catchment)** Land take for Flood Risk Management Works Majority of work driven by LFRMS will be focussed in or around large urban settlements **(no signifcant negative impact as site is outside the geographical scope of this strategy)**
Eversden and Wimpole Woods SAC. Barbastelle bats use mature trees as summer maternity (breeding) roosts.	• No loss in the area of woodland. • Maintain appropriate woodland management; particularly the number of old oak trees as bat maternity roost sites. • Limit air pollution. • No artificial light pollution. • Control disturbance within 2km of roost sites. • Maintain all hedgerows and woodland edges that act as flight-corridors for bats when they leave	Ouse	The site is designated for its Barbastelle bat population, which is dependent on the woodland for roosting. As the site is not in close proximity to any watercourses and is not	Reduction of velocity of water flow through catchments. Water held in catchments rather than exported via waste water system. Improved quality of surface water run off. **(no significant negative impact as work in Hertfordshire will not be connected to the catchment**

Site and qualifying features for designation	Key environmental conditions to support site integrity	Catchment	Hydrologcal needs	Potential impact of LFRMS and mitigations (if necessary)
	the site to forage. • Maintain all water features within 10km of the site as feeding areas.		susceptible to flooding, now, in the future, or as a result of implementing a policy 2 in unit 18, (River Great Ouse CFMP) Maintain all water features within 10km of the site as feeding areas.	**for this site** Land take for Flood Risk Management Works Majority of work driven by LFRMS will be focussed in or around large urban settlements **(no significant negative impact as site is outside the geographical scope of this strategy)**

Further detail about these sites is provided in Appendix 1, including the features associated with each of the Natura 2000 sites. Additional information about the Natura 2000 site features is available on the Joint Nature Conservation Committee website (www.jncc.gov.uk).

Further details about the Ramsar sites are available on the Ramsar website (http://www.ramsar.org).

Information on status, condition and conservation objectives for Natura 2000 sites is available from NE (www.naturalengland.org.uk).

4.3 Screening of Measures

An initial screening exercise was applied to the measures that will be addressed in the LFRMS, the aim was to:

- identify measures that, because of their nature, could not conceivably have a negative effect or are not suitable for assessment;
- identify measures that are necessary for the conservation management of Natura 2000 sites.

These measures were screened out, leaving a reduced list of potential measures that require further assessment.

4.3.1 Measures That could Not Have a Negative Effect or are Not Suitable for Assessment

The types of measure that could not conceivably have an effect or are not suitable for assessment are summarised in Table 2.

Table 2. Summary of Types of Measure That Have Been Screened Out

Type of measure	Reason for screening out of further assessment	Example measures
Education, awareness, influence, encourage, promote, advise, provide guidance	These types of measure are expected to contribute to achieving flood management objectives through raising awareness. Due to their intangible nature, assessment of these with regard to European sites has not been included.	Effectively convey improved flood risk information to local communities to ensure they have a full understanding of the flood risk in their area
Research, monitor, investigate, collect data/information, review	These types of measure improve our understanding of the environment. These actions are concerned with information gathering rather than taking any concrete actions and as such have not been assessed. They will however contribute to making sure that water management actions are fully	Carry out investigative monitoring and field work into the origins, causes of and solutions to flooding where we need to improve certainty.

Type of measure	Reason for screening out of further assessment	Example measures
	informed and based on good evidence.	
Regulation, legal requirement	Measures that identify existing legislation or proposed new regulation have not been assessed.	Comply with EU Floods Directive transposed via the Flood Risk Regulations 2009
Partnerships, working together, sharing information, coordinated approach	These describe ways of working rather than physical actions and are not suitable for assessment.	Agree and implement protocols to: • identify, report and record flood events in Hertfordshire • designate structures and features which make a significant contribution to local flood risk

4.3.2 Measures necessary for the Conservation Management of Natura 2000 Sites

These are measures identified by Natural England to improve the water or water dependent environment to the extent necessary to maintain at or restore to favourable conservation status the water-dependent habitats and species for which a Natura 2000 Protected Area is designated.

Measures that are for the nature conservation management of a site could have negative effects on the site features if carried out in the wrong place within a site, or at the wrong time of year. It is also possible that measures for the management of one habitat or species, or for one particular Natura 2000 site, may have negative effects on another. The spatial scale, location, timing and nature of these actions are critical. The organisations responsible for these measures will have to agree to necessary measures through consultation with Natural England. There is also a requirement to get Natural England consent before any operations are undertaken, or permitted, that are likely to damage these sites. Therefore these actions have been screened out of the assessment.

4.4 Identify Hazards to European Sites

The aim of this part of the assessment is to consider the remaining potential measures in further detail and to identify the hazards that implementation of the measures could pose to European sites. Actions do not have to be implemented within a European site to pose a hazard, for example works to a river downstream of a site designated for fish spawning my affect the ability of fish to travel upstream to that site.

All measures that can reasonably be predicted to pose hazards to European sites have been identified; the results of the screening and hazard identification for all measures. The measures that could pose hazards can be grouped into a number of measure types.

The hazards associated with these types of measures are summarised in Table 3.

Table 3. Potential Hazards Associated with Types of Measures

Type of measure	**Reason for being a potential hazard**
Flood alleviation schemes and practical measures	**Connecting water bodies, improving, flood plain connectivity** Increasing connectivity of rivers and improving flood plain connectivity could lead to increases in movement of invasive non-native species. Works themselves may cause physical damage and disturbance and may cause turbidity and lead to smothering as the sediment settles.
	Flow manipulation, water level management Changes in water levels, changes in the flow or velocity regime and changes to the physical regime. Habitat loss resulting from change in wetted area of a river.

4.5 Assessment of Likely Significant Effect

A plan is likely to have a significant effect if it may reasonably be predicted to affect the conservation objectives of the features for which a European site was designated. This excludes trivial or inconsequential effects.

Determining whether there will be a 'likely significant effect' does not imply that there will be such an effect or even that an effect is more likely than not**.**

4.5.1 Considering Likely Significant Effect of an Individual Measure

The LFRMS is a high-level plan, it identifies measures, but the detail of exactly where and how the individual measures will be implemented will be developed at a later stage when the measure progresses towards implementation. The LFRMS does not constrain where or how the individual measures are implemented; the measures could go ahead somewhere or in some way that will not have a significant negative effect on any European site.

Table 4 considers the likely significant effect of the 6 policies within the LFRMS.

Table 4 Impact of LFRMS Policy on Natura 2000 Sites

LFRMS Policy	**Impact of LFRMS Policy on Natura 2000 Sites**
POLICY 1. Role of Lead Local Flood Authority The county council will seek to develop an inclusive and collaborative approach to the sustainable management of local flood risk in Hertfordshire through:- • a proportionate and risk based approach; • working in partnership locally and more widely as appropriate; • publication of criteria on which decisions are based; • community focus; • where possible making information freely available; and • opportunities for additional benefits (sustainability, environment)	Policy has no impact on Natura 2000 sites so screened out of HRA.

LFRMS Policy	Impact of LFRMS Policy on Natura 2000 Sites
POLICY 2. Investigation and reporting of flood events Flood events reported to the county council will be recorded and where necessary appropriately investigated in line with the criteria set out in the procedure "Recording and Investigation of Flood Events".	Policy has no impact on Natura 2000 sites so screened out of HRA.
POLICY 3. Register of Structures and Features Any structure or feature that has a significant effect on local flood risk will be placed on the public register. The determination of structures and features to be placed on the register will be made by the Lead Local Flood Authority in consultation with the relevant risk management authorities and the structure or feature's owner.	Policy has no impact on Natura 2000 sites so screened out of HRA.
POLICY 4. Consenting and Enforcement activities relating to Ordinary Watercourses The county council will operate a risk based approach to the consenting and enforcement activities relating to ordinary watercourses. Where required activity will be coordinated with • district councils as they have statutory functions relating to development control and management of ordinary watercourses • the Environment Agency as they have a statutory functions relating to pollution and water resources • Natural England as they have statutory functions relating to species habitats and protected sites • other relevant bodies where there are consequences for regulated functions such as highways and historic environment	Policy has no impact on Natura 2000 sites as a policy identifies Natural England as a partner in any activity undertaken at a project and programme level. As a result of this any concerns raised by Natural England in relation to impacts on any Natura 2000 sites will be taken into consideration in any application for consent and these will have to be avoided for consent to be approved. Therefore this policy is screened out of HRA.

LFRMS Policy	Impact of LFRMS Policy on Natura 2000 Sites
POLICY 5. Sustainable Drainage (SuDS) Approval Body Hertfordshire County Council as Lead Local Flood Authority is required to determine the arrangements for surface water drainage schemes linked to new development. When setting up the guidelines under which the SuDS Approval Body will operate Hertfordshire County Council will work with the district planning authorities to ensure that any relevant SuDS will, in addition to meeting the requirements under the National Standards, as far as it practically possible, make a contribution to local amenity and environment appropriate to the locality in Hertfordshire.	Policy has no impact on Natura 2000 sites. so screened out of HRA.
POLICY 6. Designation of Structures and Features Hertfordshire County Council will work with the Risk Management Authorities to develop and keep under review criteria and a protocol for the designation of third party structures and features which are deemed to have a significant effect on local flood risk.	Policy has no impact on Natura 2000 network so screened out of HRA.

4.5.2 Interaction of the Individual Measures in the Plan

It is possible that the measures in the plan could act in combination to have a significant effect on the interest features of European sites. The LFRMS does not constrain where or how the measures will be implemented; the measures could go ahead somewhere or in some way that will not have a significant negative effect in combination with each other on any European sites.

4.5.3 In-combination Assessment with other Plans or Projects

It is possible that the measures in the Strategy could act in combination with other plans and projects to have a significant effect. Given the extensive range of plans and projects that may affect European sites within the plan area and the lack of location specific information about the measures in the Plan, a pragmatic approach to the in combination assessment is required. Other competent authorities have not been consulted for information on other

plans and projects as part of this Habitats Regulations Assessment because the Strategic Environmental Assessment (SEA) of the draft LFRMS for Hertfordshire identifies other plans that may be relevant. To ensure this in combination assessment remains focussed it has been limited to those plans and projects identified in the SEA as having a significant interaction with the LFRMS for biodiversity, flora and fauna require consideration.

The SEA identifies where the LFRMS could influence existing plans and policies and vice versa; it also includes identification of potentially conflicting plans and policies.

Table 5 lists and describes the positive interactions of the plans identified in the SEA as having significant interactions for biodiversity, flora and fauna. No negative interactions were identified.

Table 5. Plans Identified in the SEA as Having Significant Positive Interactions for Biodiversity, Flora and Fauna

Plan	Description of significant positive interactions
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, 2011	The strategy presents a comprehensive picture of how the Government are implementing their international and EU commitments with regard to biodiversity. It sets out the strategic direction for biodiversity policy, ascertains priority areas for intervention and details a number of measures through which progress could be tracked.
Working with the Grain of Nature: A Biodiversity Strategy for England, 2011	This report references how the creation or restoration of habitats can help flood risk management. It is likely that through wetland creation and managed realignment it will be possible to provide washland storage to help flood alleviation of urban areas, and as compensation for freshwater wetland habitats lost due to coastal squeeze. In the process biodiversity targets set for flood defence operating authorities applicable to all flood defence capital schemes will result in net gains of habitats, such as chalk rivers and saltmarsh.
Wildlife & Countryside Act, 1981 (as Amended); Countryside and Rights of Way Act, 2000	The purpose of the Act is to create a new statutory right of access on foot to certain types of open land, to modernise the public rights of way system, to strengthen nature conservation legislation, and to facilitate better management of AONBs. Government departments are required to have regard for biodiversity in carrying out its functions, and to take positive steps to further the conservation of listed species and habitats. The

Plan	Description of significant positive interactions
	protection of SSSIs, already established in the Wildlife and Countryside Act, is strengthened giving greater power to Natural England. Local Authorities have a statutory duty to further the conservation and enhancement of SSSIs both in carrying out their operations, and in exercising their decision making functions. The Act strengthens legal protection for threatened species and assists in bringing offenders to justice, and provides for stronger penalties. The Countryside and Rights of Way Act 2000 provides for the statutory right of access to open country and registered common land, modernise the rights of way system, give greater protection to SSSIs, provide better management arrangements for AONBs and strengthen wildlife enforcement legislation.
Directing the Flow: Priorities for Future Water Policy, 2002	Sets future water policy to implement the Water Framework Directive. Highlights that considerably more emphasis needs to be put on integrating water policies with policies in other areas additional to health, especially with regard to: • Agriculture and fisheries; • Biodiversity; • Tourism and recreation; • Land-use planning.
The Natural Environment and Rural Communities (NERC) Act, 2006	Established Natural England and united in a single organisation the responsibility for enhancing biodiversity and landscape – in rural, urban and coastal areas – with promoting access and recreation. Other relevant elements include: provisions to address a small number of gaps and uncertainties which have been identified for Sites of Special Scientific Interest (SSSIs), provisions to make amendments to the Wildlife and Countryside Act 1981 to improve wildlife protection, extension of the CROW biodiversity duty to public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity, provisions to amend the flood defence byelaw-making powers of the Environment Agency, Local Authority and Internal Drainage Board to allow them to take nature conservation into account when determining consent for flood defence works.
UK Biodiversity Action	The UK BAP describes the biological resources of

Plan	Description of significant positive interactions
Plan, 2004	the UK and provides detailed plans for conservation of these resources, at national and devolved levels. Action plans for the most threatened species and habitats have been set out to aid recovery, and reporting rounds every three- to five-years show how the UK BAP has contributed to the UK's progress towards the significant reduction of biodiversity loss
A 50 year vision for the wildlife and natural habitats of Hertfordshire – A Local Biodiversity Action Plan, 1998, (Reviewed 2006)	Identifies flagship species and habitats within Hertfordshire and then establishes an action plan for each for their conservation. Key principles: ***Assess -*** the biodiversity value of the site. ***Protect -*** current key habitats and species of wildlife interest. ***Enhance and Create -*** enhance existing habitats or create new areas. ***Mitigate -*** against potentially damaging impacts on wildlife. ***Compensate -*** where damage is unavoidable to wildlife. ***Monitor and Enforce -*** to promote the success of enhancement, mitigatory and compensatory measures. ***A Checklist -*** for developers and planners.
East of England Plan, 2008	This plan is a revision of the Regional Spatial Strategy and sets out a spatial vision that "by 2021 the East of England will be realising its economic potential and providing a high quality of life for its people, including by meeting their housing needs in sustainable inclusive communities. At the same time it will reduce its impact on climate change and the environment, including through savings in energy and water use and by strengthening its stock of environmental assets." The vision is supported by 5 objectives, which are as follows: • to reduce the region's impact on, and exposure to, the effects of climate change; • to address housing shortages in the region; • to realise the economic potential of the region and its people; • to improve the quality of life for the people of the region; and • to improve and conserve the region's

Plan	Description of significant positive interactions
	environment

At this high-level plan stage it is not appropriate to consider the prevailing environmental conditions at each European site. This would not add anything useful to the assessment as the plan does not include detail or constrain where the measures will be implemented. However the following prevailing conditions and environmental changes at the Surface Water Management Plan level have been taken into account in the assessment:

- Development can impact on biodiversity through both direct habitat loss as well as through indirect affects, such as the loss of water from water dependent habitat types.
- Growth will place additional demands on the ability to deal with waste water. If physical infrastructure, such as sewage treatment works, and environmental capacity to receive discharges is exceeded, water quality, which is already suffering in some locations, may deteriorate.
- The whole of the East of England is an area classed as suffering from serious water stress. Over abstraction of water bodies, particularly groundwater, contributes to low flow, which in turn can contribute to poor water quality as a result of the reduced ability to dilute polluting inputs.
- Increased growth will put additional pressure on the available water resources.
- The risk of negative effects in combination is very low as the measures in the plan are intended to secure no deterioration in status across the water environment in the context of the other plans and projects and prevailing conditions.

The LFRMS does not constrain where or how the measures will be implemented; the measures could go ahead somewhere or in some way that will not have a significant negative effect on a European site in combination with other plans or projects. The risk of negative effects in combination is very low as the measures in the plan are intended to secure no deterioration in status across the water environment in the context of the other plans and projects and prevailing conditions.

The information considered in this in combination assessment may help inform Habitats Regulations assessments of individual measures undertaken at later plan, project or permission stages (Surface Water Management Plans), however later assessments will require their own in combination assessments.

4.5.4 Likely Significant Effects on the Natura 2000 Sites

Five of the six sites identified Natura 2000 sites have been scoped out because of the following considerations:

- their hydrology is unlikely to be affected due to their location;
- they are either outside the catchments that the strategy will influence or at the head of catchments;
- they are not associated with existing areas where flood risk mitigation may take place; or
- locally the sites are elevated above their surroundings.

The impact of each of these considerations and their relevance to the specific sites is summarised in table 6.

It should also be noted that the potential location of new development coming forward within the lifetime of this strategy (3 – 5 years) has not been taken into account because assessment of the relevant spatial plans and policies should ensure that the location of new development and its potential impact on Natura 2000 sites will be considered by that plan. In addition the relevance of the strategy to new development relates primarily to the approval of SuDS, the outcome of which will generally be near natural processes leading to more water being retained in catchments and an improvement to the quality of runoff.

There is potential for the strategy to have an impact on one of the six relevant Natura 2000 sites, the Lee Valley SPA and Ramsar site. Some of the component sites are within areas that will be influenced by the strategy. However it is believed that the impacts will either be not significant and where there is an impact it is likely to be beneficial. At an area wide scale the aggregate outcome is likely to be more water retained in the catchment for longer and an improvement in water quality which match the hydrological needs of the sites.

At a more local scale there is potential for sites to be directly affected as the LLFA has the powers to reduce or increase flood risk in an area. The LLFA also has to consider sustainable development when it discharges its flood risk management functions. The relevance of this to the Lee Valley Natura 2000 sites is that when flood risk management schemes are developed which have the potential to directly influence water resources for the sites the hydrological needs of the sites would be considered and accommodated.

Table 6 Likely significant effects on the scoped in European Sites

Natura 2000 Sites	Will strategy have a potential impact?	Rationale	Evidence	Will any impact be adverse?	Rationale
Epping Forest SAC	No	Site not in a catchment that the strategy will influence.	Figure 3	N/A	N/A
Burnham Beeches SAC..	No	Site not in a catchment that the strategy will influence	Figure 3	N/A	N/A
Eversden and Wimpole Woods SAC	No	Site not in a catchment that the strategy will influence	Figure 3	N/A	N/A
Chilterns Beechwoods SAC.	No	Site at head of catchment. Site not associated with any existing areas of development.	Figure 4 Figure 2	N/A	N/A
Wormley Hoddesdonpark Woods SAC.	No	Site at head of catchment. Site not associated with any existing areas of development..	Figure 4 Figure 2	N/A	N/A
Lee Valley SPA and Ramsar site.	Yes	Site in a catchment that the strategy will influence Sites associated with existing areas of development.	Figure 2, Figure 3 Figure 4	No	Where surface water is managed to reduce flood risk or linked to new SuDS provision it will generally be held for longer in the catchment. Flood risk management and SuDS will either

Natura 2000 Sites	Will strategy have a potential impact?	Rationale	Evidence	Will any impact be adverse?	Rationale
					have no effect on or improve water quantity and quality. Both outcomes are compatible with the hydrological needs of the sites (Table 1)

4.5.5 Control Measures to Avoid Likely Significant Effects

The assessment has shown that implementation of some measures could impact upon one of the Natura 2000 sites, the Lea valley SPA and Ramsar sites. At this high-level plan stage, it is not possible to determine which elements of this site may be affected, or whether the effects of the measures will be significant due to uncertainty about where and how the measures will be implemented. However, as the LFRMS does not constrain where or how the measures will be implemented; the measures could go ahead somewhere or in some way that will not have a significant effect on this Natura 2000 site.

This section considers whether appropriate control measures are in place to ensure that potential negative effects on the Natura 2000 site can be identified and avoided when the measures are progressed towards implementation.

Most types of measures that have been identified as having potential to cause hazards would require a Habitats Regulations assessment as a matter of law or Government policy before they can be implemented. A Habitats Regulations assessment at this later stage will be able to identify more precisely the nature, scale or location of action associated with the measure, and thus its potential effects. The LFRMS makes it clear that before any measures in the plan are implemented they must be subject to the requirements of the Habitats Regulations and that any plans (including district based Surface Water Management Plans (SWMPs)), projects or permissions required to implement the measures must undergo an 'appropriate assessment' if they are likely to have a significant effect.

Responsibility for Habitats Regulations assessment of plans, projects or permissions required to implement the measures in this LFRMS remains with the competent authority. For example, any measures involving work on an ordinary watercourse would not be able to legally go ahead without consent from the LLFA under the Flood and Water Management Act 2010. The LLFA would be the competent authority in this case and could not agree to any actions that would have an adverse effect on any European sites.

Table 7 provides information on the types of measures, potential hazards and control measures that will avoid impact on Natura 2000 sites.
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Table 7. Control Measures for Implementing Measures that may Affect Natura 2000 Sites

Measure	Potential hazards	Control measure
Connecting water bodies, improving, flood plain connectivity	Increasing connectivity of rivers and improving flood plain connectivity could lead to increases in movement of invasive non-native species. Works themselves may cause physical damage and disturbance and may cause turbidity and lead to smothering as the sediment settles.	Existing habitat use must be considered and there is a need to ensure that implementation has regard for impacts on Natura 2000 sites through appropriate levels of survey, investigation and impact assessment. Appropriate timing of work. Follow established good practice. Undertake HRA Scoping and Screening with advice from Natural England on all Surface Water Management Plans (SWMPs).
Flow manipulation, water level management	Changes in water levels, changes in the flow or velocity regime and changes to the physical regime. Habitat loss resulting from change in wetted area of a river.	

4.6 Conclusion of Habitats Regulations Assessment

At this high-level plan stage, the detail of where and how the measures will be implemented has not yet been developed. This assessment has identified potential hazards associated with implementation of the measures in the LFRMS but we are confident that the measures could go ahead somewhere or in some way that will not have a significant negative effect on a European site.

It has been demonstrated that controls are in place to identify any risks to European sites as the detail of the measures is developed. The LFRMS also makes it clear that before any measures in the plan are implemented they must be subject to the requirements of the Habitats Regulations and that any plans (including SWMPs), projects or permissions required to implement the measures must undergo an 'appropriate assessment' if they are likely to have a significant effect.

The LFRMS does not constrain the nature and/or scale and/or location of the measures so they can be developed in a way that will avoid the likelihood of any significant negative effects on European sites.

Tables 8 summaries the justification for screening out the LFRMS policies with respect their impact on Natura 2000 sites

Table 8 Summary of the Justification for Screening out the LFRMS Policies with Respect to Their Impact on Natura 2000 Sites

LFRMS Policy	Justification for screening out
POLICY 1. Role of Lead Local Flood Authority	Policy has no impact on Natura 2000 sites.
POLICY 2. Investigation and reporting of flood events	Policy has no impact on Natura 2000 sites.
POLICY 3. Register of Structures and Features	Policy has no impact on Natura 2000 sites.
POLICY 4. Consenting and Enforcement activities relating to Ordinary Watercourses	Policy has no impact on Natura 2000 network as the policy identifies Natural England as a partner in any activity undertaken at a project and programme level.
POLICY 5. Sustainable Drainage (SuDS) Approval Body	Policy has no impact on Natura 2000 sites.
POLICY 6. Designation of Structures and Features	Policy has no impact on Natura 2000 sites.

Table 9 summaries the justification for screening out of Natura 2000 sites from requiring an Appropriate Assessment.

Table 9 Summary of the Justification for Screening out the Natura 2000 Sites

Natura 2000 site	**Justification (mitigation & avoidance measures shown in brackets)**
Epping Forest SAC	Site not in a catchment that the strategy will influence.
Burnham Beeches SAC..	Site not in a catchment that the strategy will influence.
Eversden and Wimpole Woods SAC	Site not in a catchment that the strategy will influence.
Chilterns Beechwoods SAC.	Site at head of catchment. Site not associated with any existing areas of development.
Wormley, Hoddesdon park Woods SAC.	Site at head of catchment. Site not associated with any existing areas of development.
Lee Valley SPA and Ramsar site.	Site in a catchment that the strategy will influence Sites associated with existing areas of development. (Where surface water is managed to reduce flood risk or linked to new SuDS provision it will generally be held for longer in the catchment. Flood risk management and SuDS will either have no effect on or improve water quantity and quality. Both outcomes are compatible with the hydrological needs of the sites (Table 1))

5. Conclusion

It is concluded that the LFRMS is not likely to have any significant negative effects on any European sites, alone or in combination with other plans or projects. Given this conclusion, there is no requirement to progress to the next stage of the Habitats Regulations Assessment.

This conclusion does not remove the need for later Habitats Regulations Assessment of any other plans, projects, or permissions associated with, or arising out of, the measures identified in the Plan. Acceptance that this plan

is consistent, so far as can be ascertained, with the Habitats Regulations does not guarantee that any plan or project derived from the Plan will also be found consistent.

APPENDIX 1. Natura 2000 Site Descriptions

Protected Sites; Joint Nature Conservation Committee website.

Chilterns Beechwoods SAC.

Area (ha): 1276

General site character: Heath. Scrub. Maquis and garrigue. Phygrana (4%). Dry grassland. Steppe (8%).
Broad-leaved deciduous woodland (88%).

Annex 1 habitats that are a primary reason for the selection of this site:

- 9130: *Asperulo-Fagetum beech forests:* the Chilterns Beechwoods represent a very extensive tract of *Asperulo-Fagetum beech forests* in the centre of the habitat's UK range. The woodland is an important part of a grassland-scrub-woodland mosaic. A distinctive feature in the woodland flora is the occurrence of the rare Coralroot *Cardamine bulbifera.*

Annex 1 habitats present that are a qualifying feature, but not a primary reason for site selection:

- 6210: Semi-natural dry grasslands and scrubland on calcareous substrate (*Festuco-Brometalia*).

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- 1083: Stag beetle *Lucanus cervus.*

Chilterns Beechwoods 1

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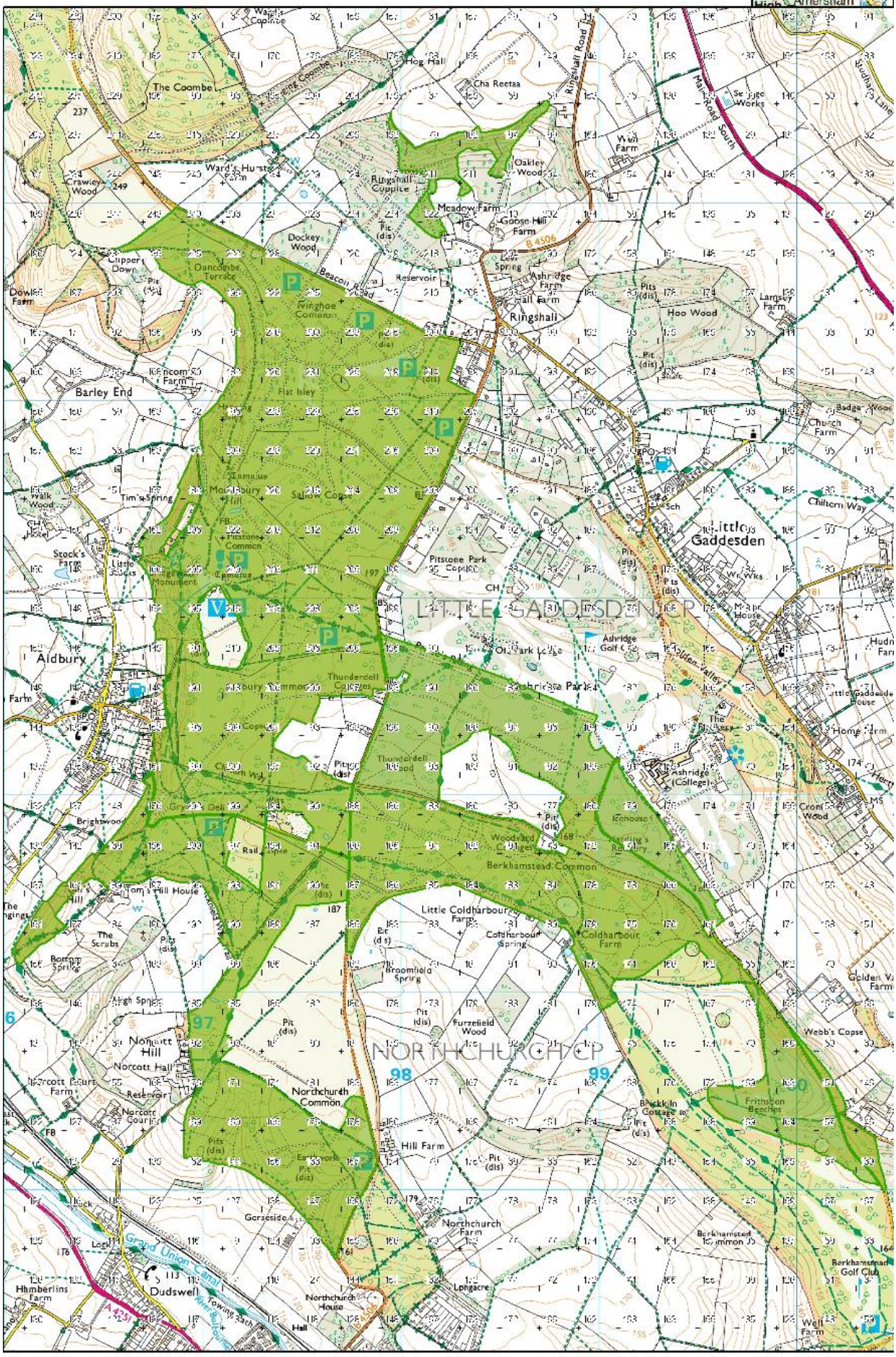

Chilterns Beechwoods 2

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Chilterns Beechwoods 3

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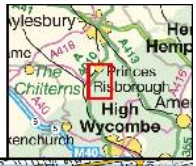

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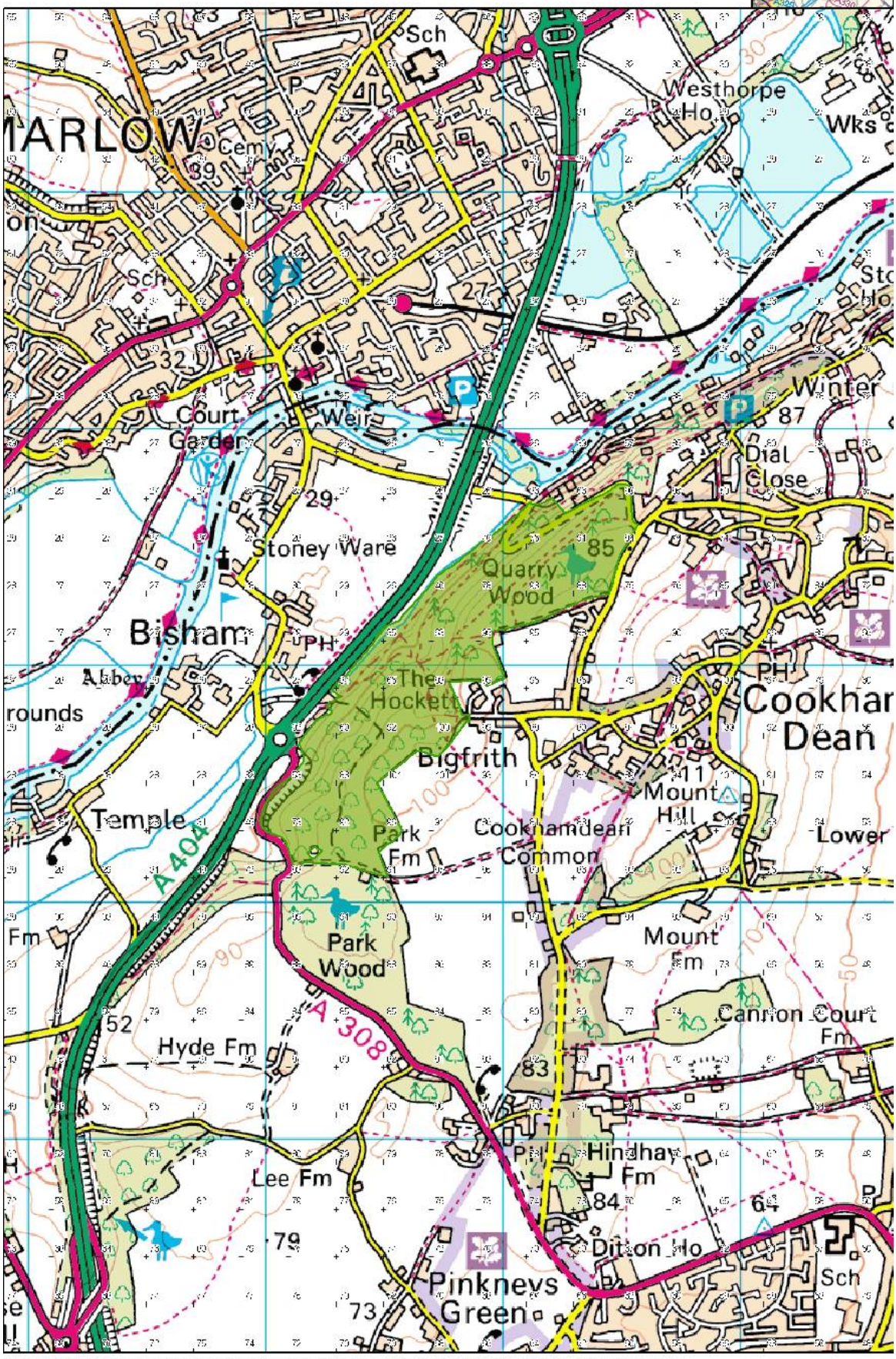

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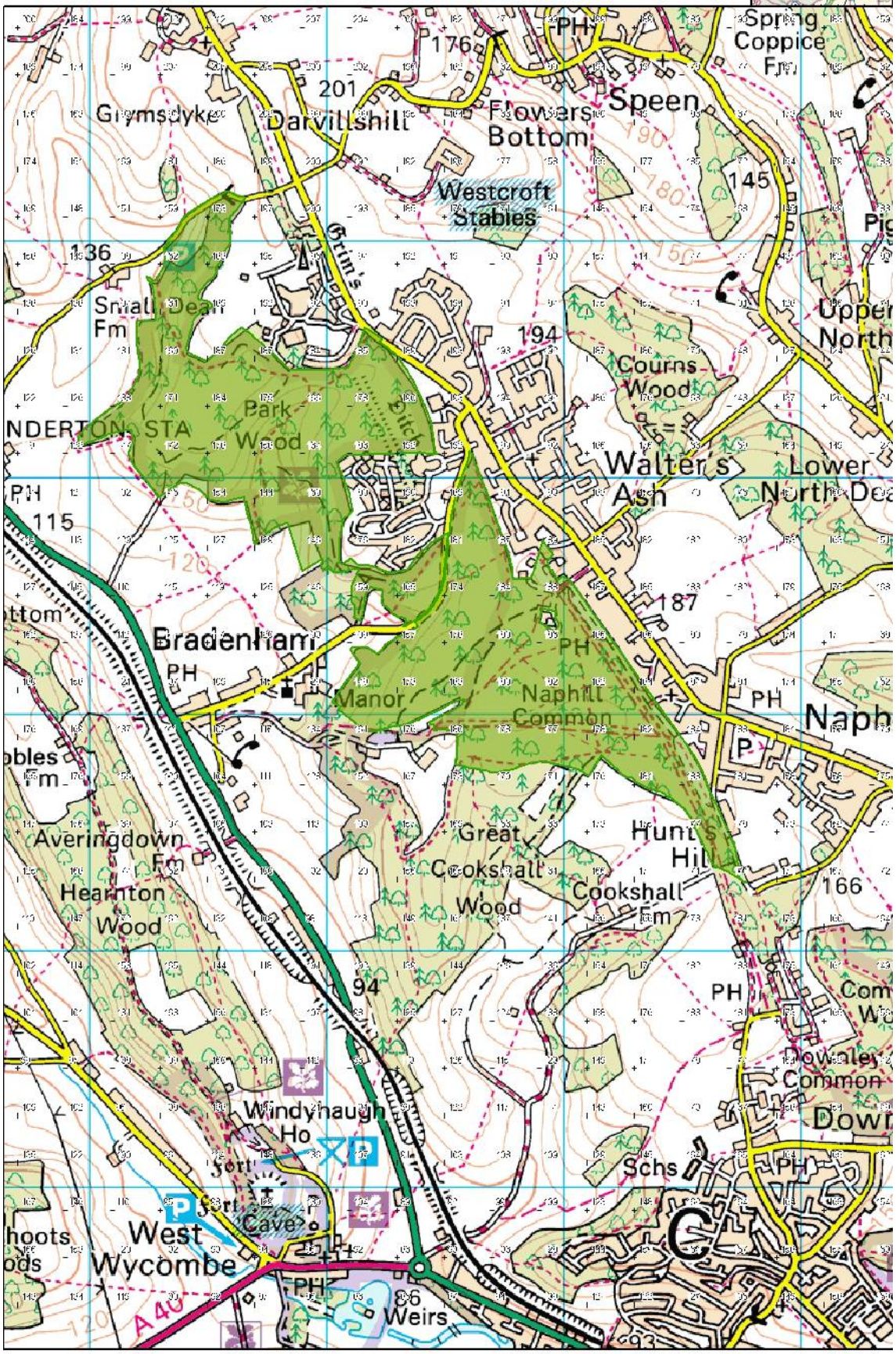

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Chilterns Beechwoods 7

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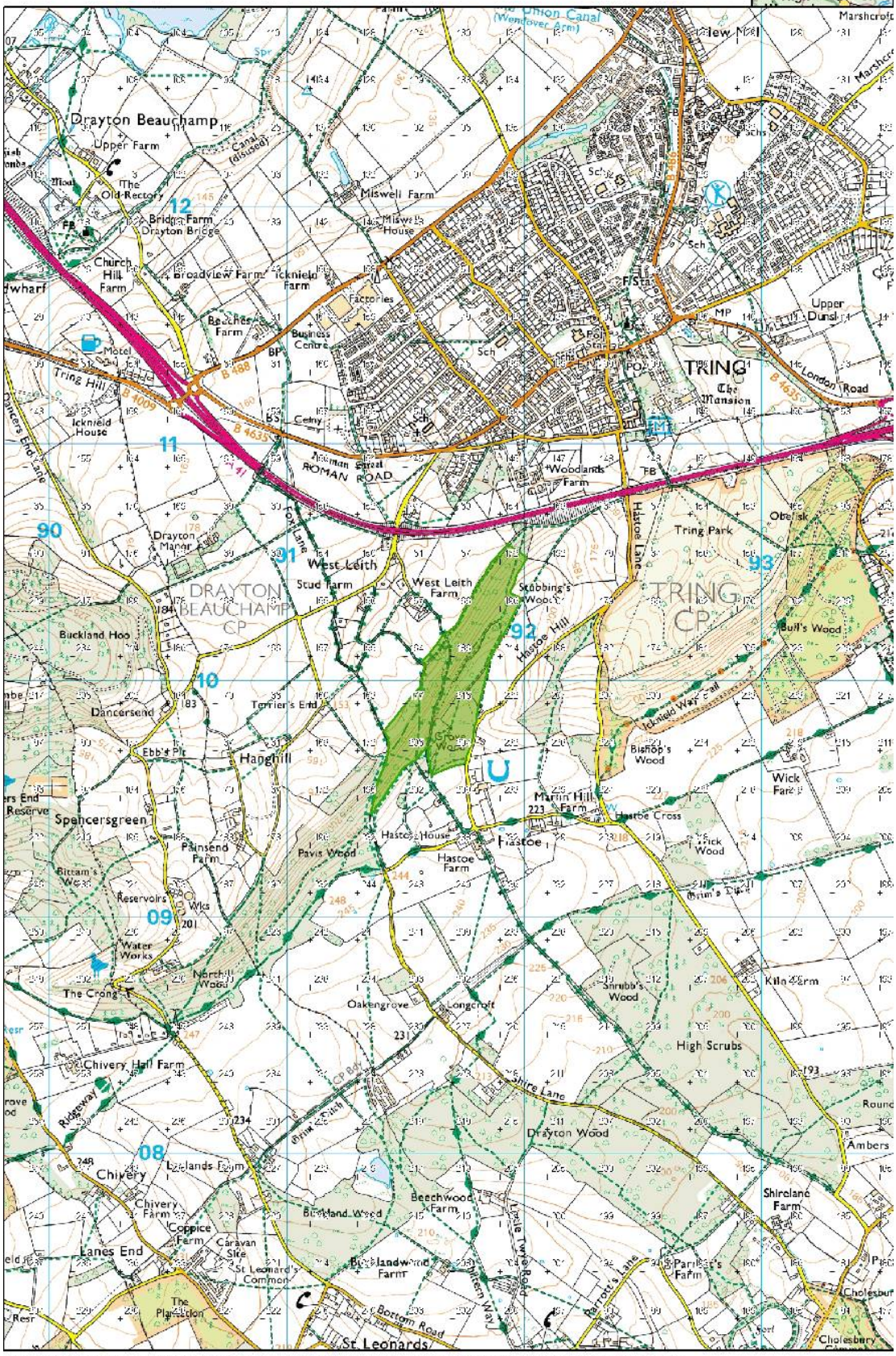

Wormley Hoddesdonpark Woods SAC.

Area (ha): 335

General site character: Heath. Scrub. Maquis and garrigue. Phygrana (2%). Dry grassland. Steppe (3%).
Broad-leaved deciduous woodland (90%).
Coniferous woodland (3%)
Mixed woodland (2%)

Annex 1 habitats that are a primary reason for the selection of this site:

- 9160: Sub-Atlantic and medio-European Oak or Oak-Hornbeam forests of *Carpinion betuli*. Hoddesdonpark Woods in south-east England has large stands of almost pure Hornbeam *Carpinus betulus* (former coppice), with Sessile Oak *Quercus petraea* standards. Areas dominated by Bluebell *Hyacinthoides non-scripta* occur; elsewhere there are stands of Great Wood-rush *Luzula sylvatica* and carpets of the mosses *Dicranum majus* and *Leucobryum glaucum*. Plus, a bryophyte community more typical of continental Europe with the mosses *Dicranum montanum, D. flagellare* and D*. tauricum*.

Wormley-Hoddesdonpark Woods

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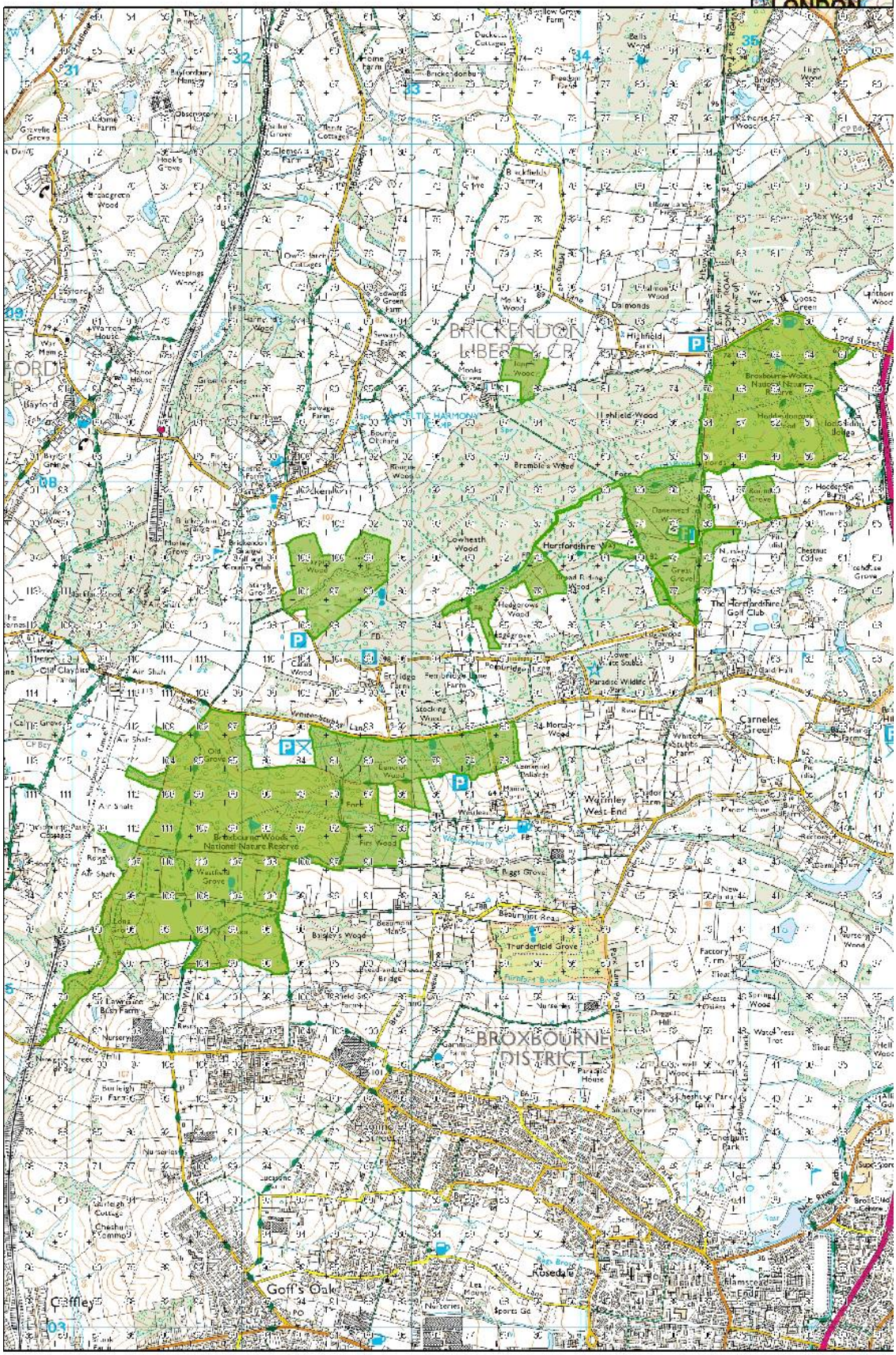

Lee Valley SPA and Ramsar sites.

Area (ha): 448

Component SSSI: Amwell Quarry (Local Nature Reserve); Rye Meads; Turnford and Cheshunt Pits; Walthamstow Reservoirs.

General site description: the Lee Valley SPA is located to the north-east of London. The valley supports a range of man-made, semi-natural and valley-bottom, wetland habitats including embanked water supply reservoirs, sewage treatment lagoons and former gravel pits, that occupy approximately 20km of the valley. The wetlands support wintering wildfowl; in particular, Gadwall *Anas strepera* and Shoveler *Anas clypeata*, which occur in numbers of European importance. Areas of reedbed support significant numbers of wintering Bittern *Botaurus stellaris*.

Qualifying over-wintering species: under Article 4.1 of the Directive (79/409/EEC):

- Bittern *Botaurus stellaris*; 6 individuals represent at least 6% of the wintering population in Great Britain (5 year peak mean; 1992/3 – 1995/6).

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

- Gadwall *Anas strepera*; 515 individuals represent at least 1.7% of the wintering North-western European population (5 year peak mean; 1991/2 – 1995/6).
- Shoveler *Anas clypeata*; 748 individuals represent at least 1.9% of the wintering Northwester/Central European population (5 year peak mean; 1991/2 – 1995/6).

Amwell LNR

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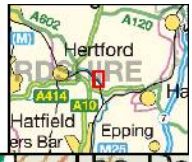

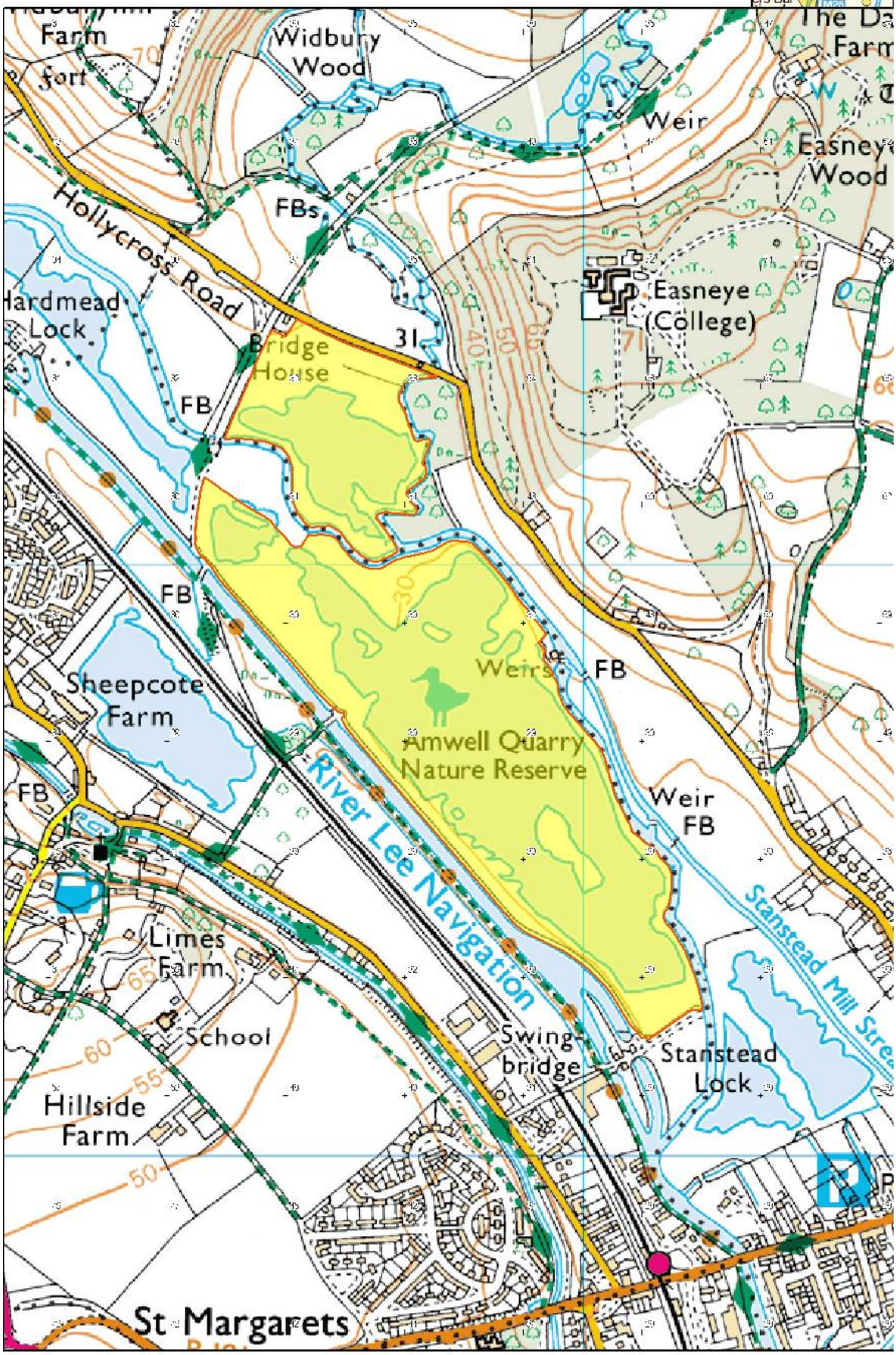

Rye Meads

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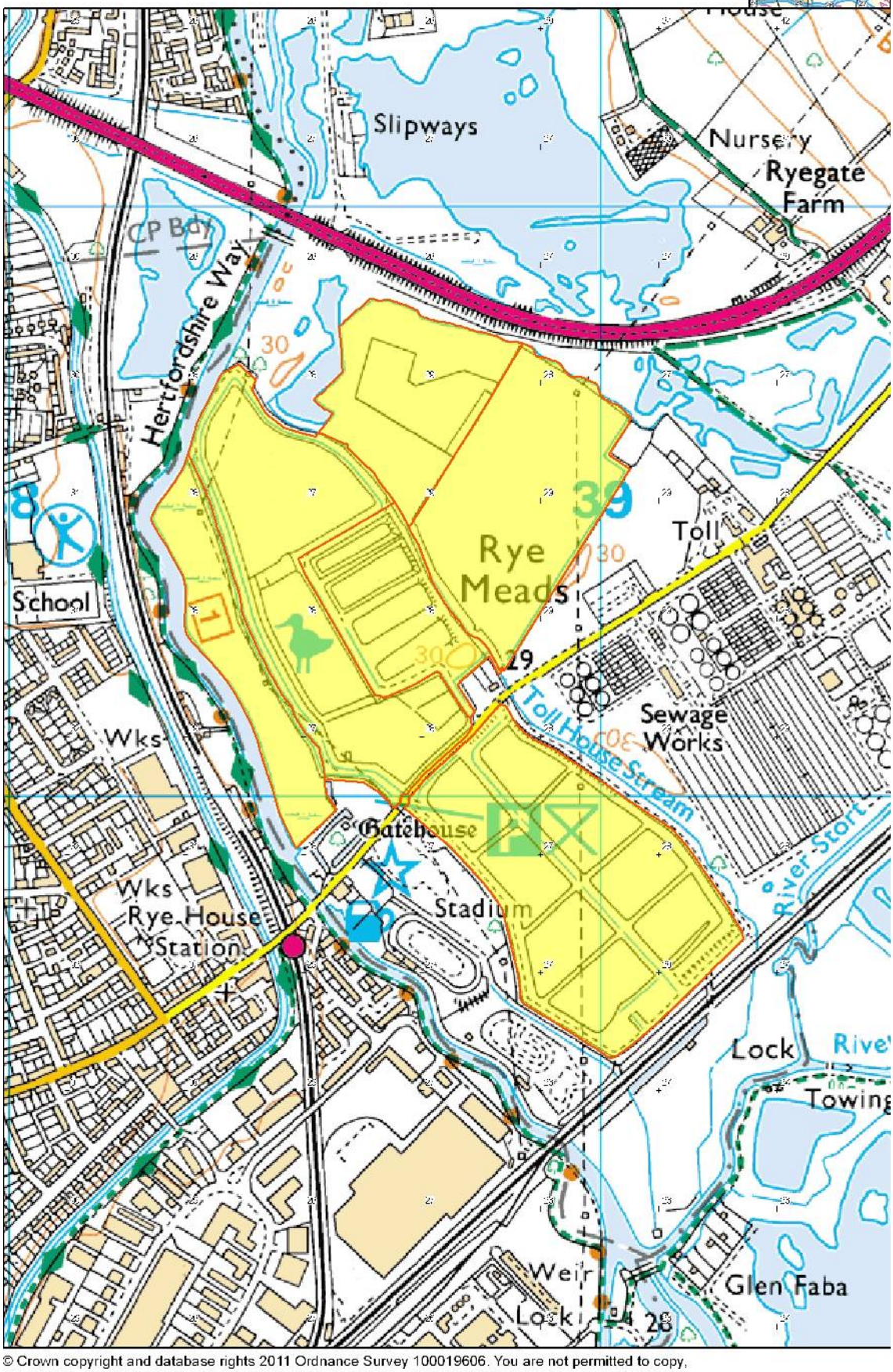

Turnford and Cheshunt Pits

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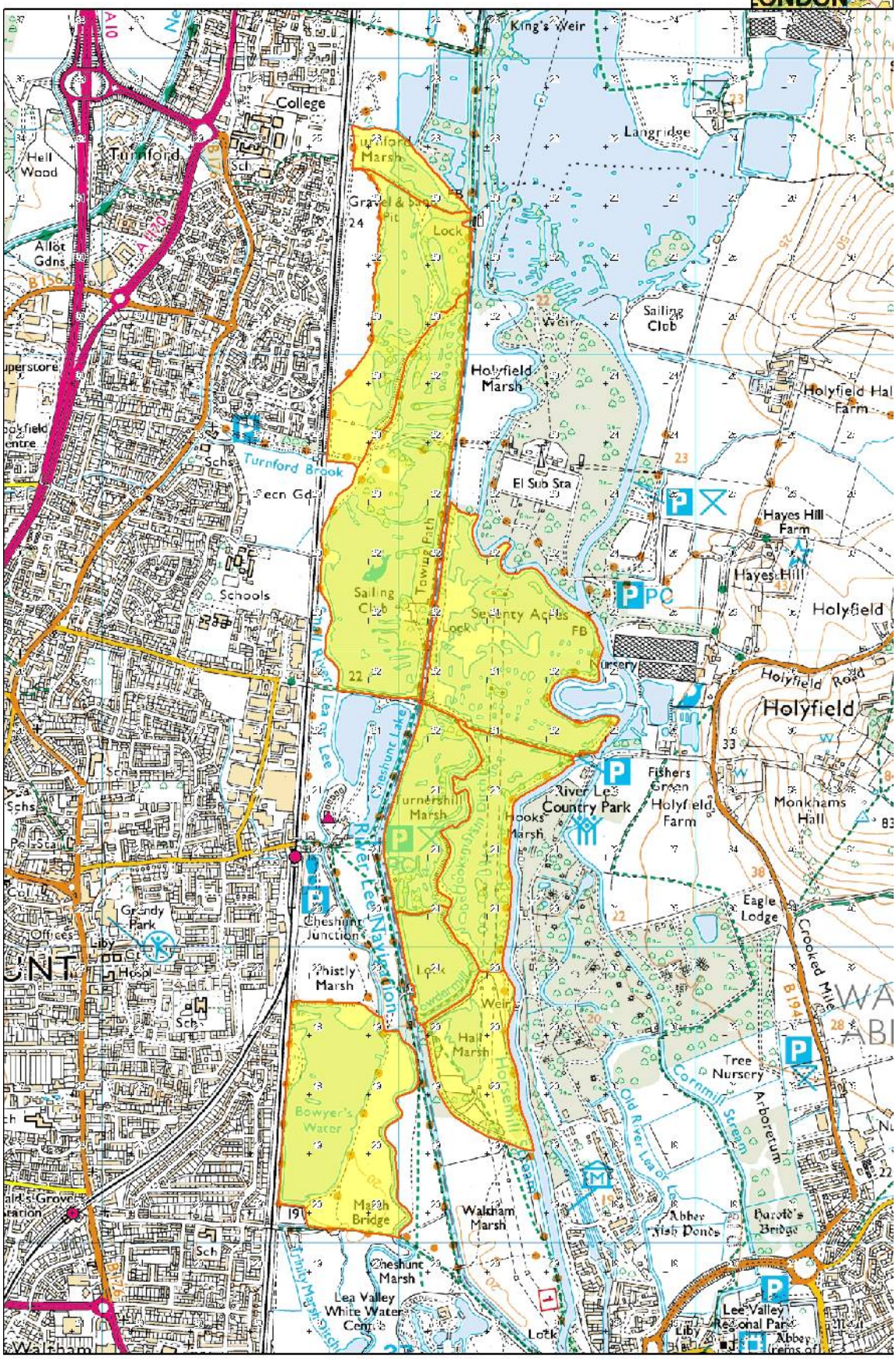
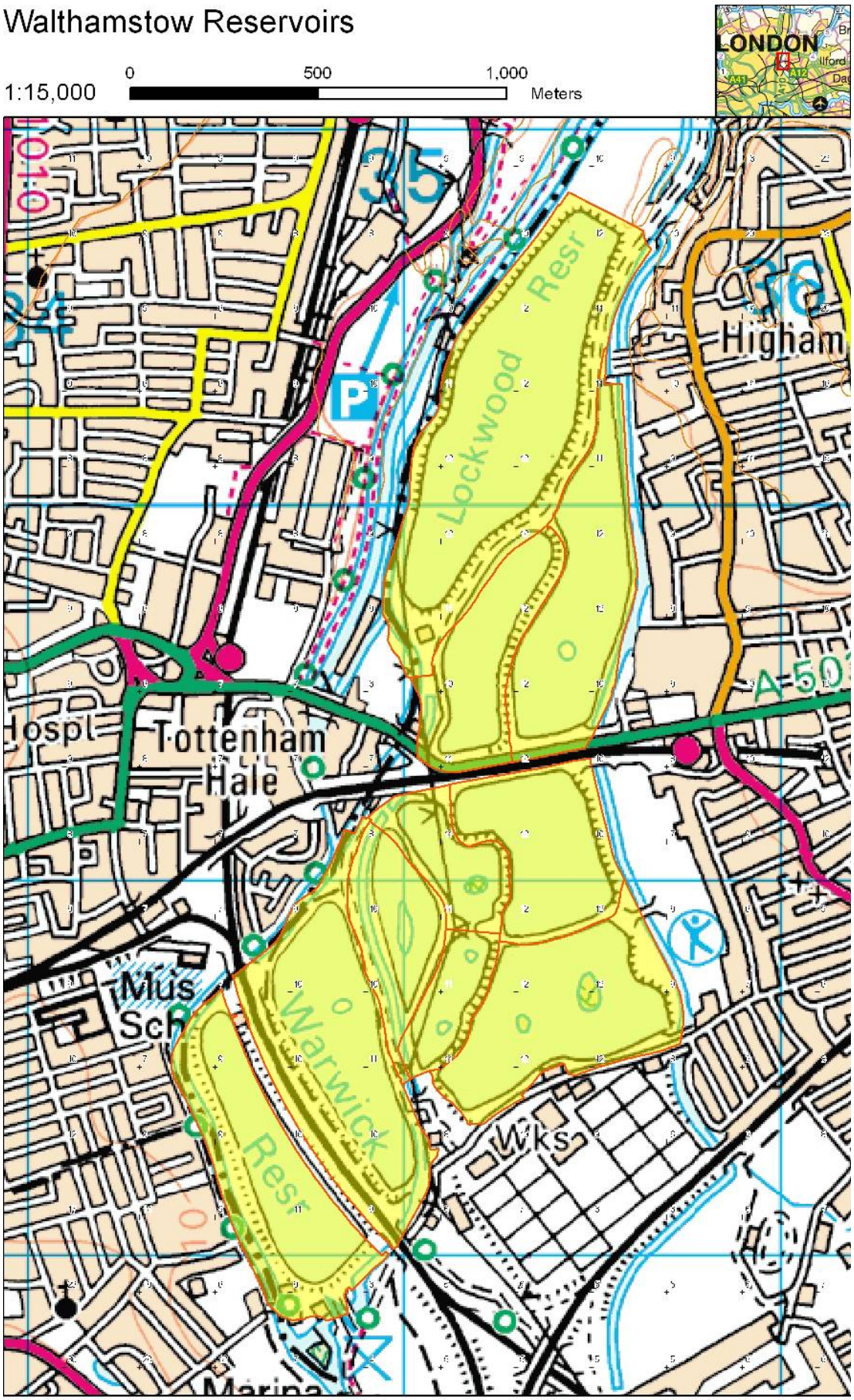


Walthamstow Reservoirs



Epping Forest SAC.

Area (ha): 1605

General site character: Inland water bodies (standing and running water) (6%).
Bogs. Marshes. Water-fringed vegetation. Fens (0.2%).
Heath. Scrub. Maquis and garrigue. Phygrana (3.8%).
Dry grassland. Steppe (20%).
Broad-leaved deciduous woodland (70%).

Annex 1 habitats that are a primary reason for the selection of this site:

- 9120: Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercus robori-petraeae* or *Ilica-Fragenion*). Epping Forest represents Atlantic acidophilous beech forests in the north-eastern part of the habitat's UK range. Although the epiphytes at the site have declined, largely as a result of air pollution, it remains important for a range of rare species, including the moss *Zygodon forsteri*. The long history of pollarding and resultant large number of veteran trees, ensures that the site is also rich in fungi and dead-wood invertebrates.

Annex II habitats present as a qualifying feature, but not as a primary reason for site selection:

- 4010: Northern Atlantic wet heaths with *Erica tetralix.*
- 4030: European dry heaths.

Annex II species present that are a primary reason for site selection:

- 1083: Stag beetle *Lucanus cervus.* Epping Forest is a large woodland area and records of Stag beetle *Lucanus cervus* are frequent and widespread. The site is also very important for dead-wood invertebrates and supports many Red Data Book and Nationally Scarce species.

Epping Forest (North)

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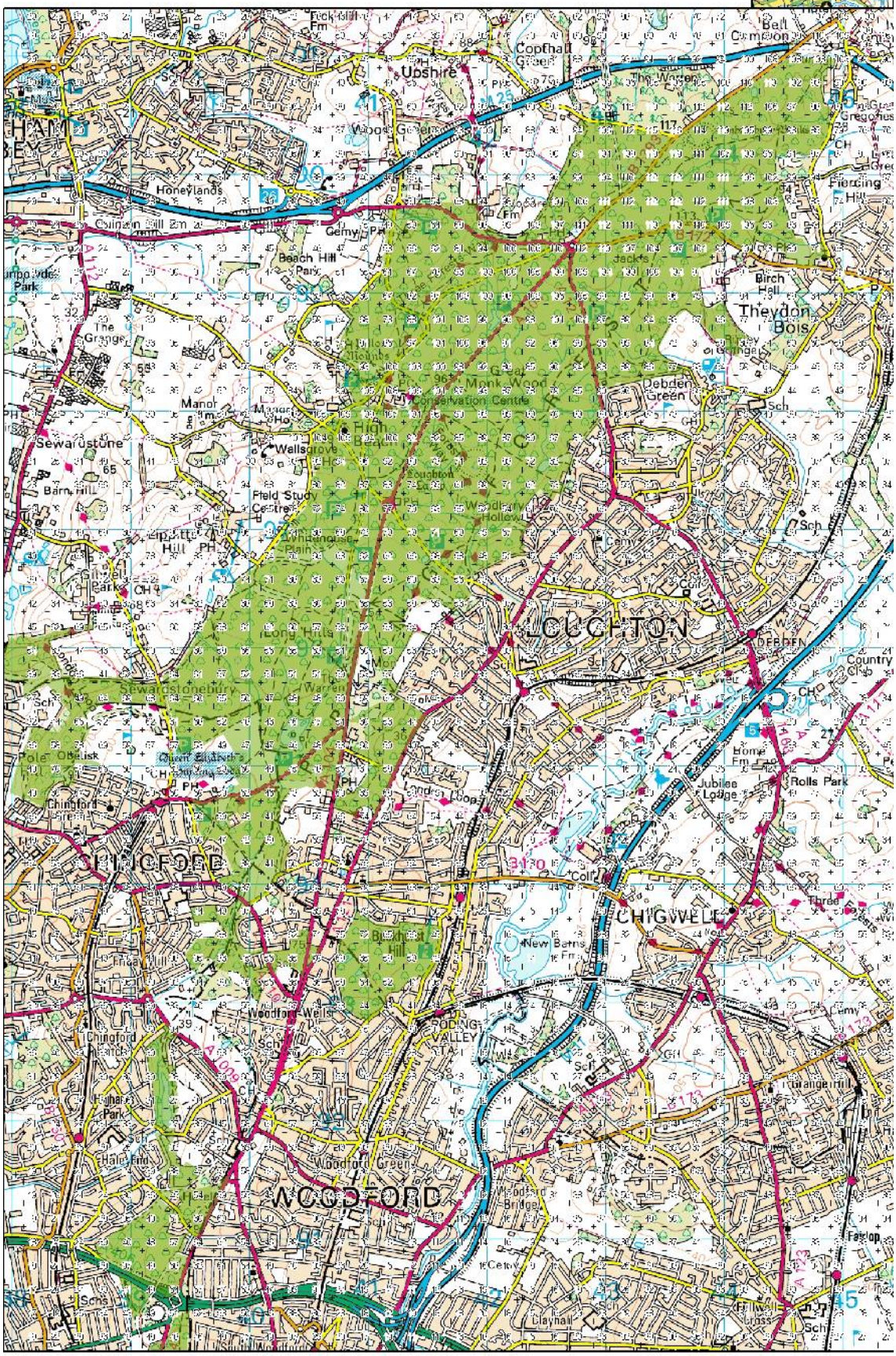

Epping Forest (South)

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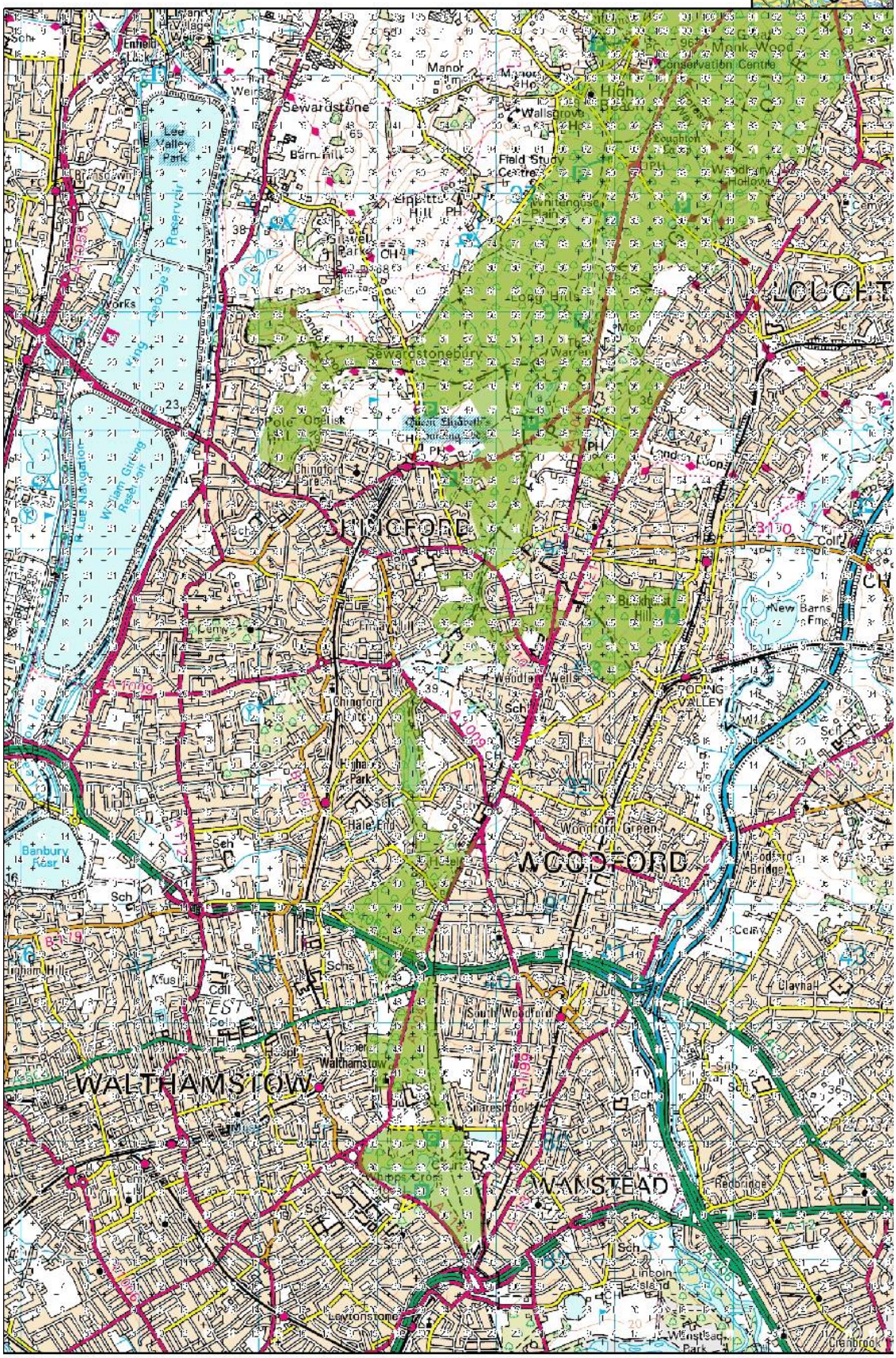

Burnham Beeches SAC.

Area (ha): 383

General site character: Heath. Scrub. Maquis and garrigue. Phygrana (5%).
Broad-leaved deciduous woodland (90%).
Coniferous woodland (5%)

Annex 1 habitats that are a primary reason for the selection of this site:

- 9120: Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercus robori-petraeae* or *Ilica-Fragenion*). Burnham Beeches is an example of Atlantic acidophilous beech forests in central southern England. It is an extensive area of former beech wood-pasture with many old pollards and associated Beech *Fagus sylvatica* and Oak *Quercus spp.* high forest. It is one of the richest sites for saproxylic invertebrates in the UK including 14 Red Data Book species. It supports nationally important epiphytic communities, including the moss *Zygodon forsteri.*

Burnham Beeches

1:25,000 0 1 Kilometers

Eversden and Wimpole Woods SAC.

Area (ha): 66

General site character: Broad-leaved deciduous woodland (100%).

Annex 1 habitats that are a primary reason for the selection of this site: not applicable.

Annex 1 habitats present as a qualifying features, but not a primary reason for the selection of this site: not applicable.

Annex II species present that are a primary reason for site selection:

- Barbastelle bat *Barbastella barbastellus*: the site comprises a mixture of ancient coppice woodland (Eversden Wood) and high forest woodland (Wimpole Woods). A colony of Barbastelle bats *Barbastella barbastellus* is associated with Wimpole Woods, where the mature trees are used as a summer maternity roost where female bats give birth and rear their young. Most of the roost sites are in tree crevices and the bats use the woods for foraging (feeding) and as a flight path to foraging areas outside the woods.

Eversden and Wimpole Woods

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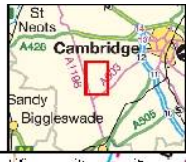

Woodlands:

Many of our woodlands occur on seasonally wet soils, particularly clays. The ecology of woodlands therefore, is closely linked to their hydrological systems; soil moisture, humidity, nutrient cycles, species composition and biomass. Humidity in woods is an important ecological factor. The canopy and shrub layers hold moisture within woods (considerably higher than the open ground outside them) and the humidity stimulates the growth of shrubs and ground vegetation, which in turn has a positive effect on invertebrates that are a food source for birds and small mammals. However, land drainage on adjacent farmland has had a detrimental effect on many of our woodlands by lowering ground-water levels, particularly at the woodland edge. Woodlands with lowered ground water levels and no shrub layer dry out. Wind penetration and loss of humidity exacerbate the impact, as do plough damage to tree roots and agricultural spray drift into the woodland edge.

The main source of water for the woodland SACs is precipitation, given their elevated locations. Any increases in rainfall should not prove to be detrimental to the integrity of the European woodland SACs. Some surface inundation may occur in exceptional periods of rainfall, but the underlying geology is capable of absorbing and storing water in the underlying chalk aquifer.
Any long-term and significant changes in ground water levels has the potential to effect species composition, canopy cover, shrub layer and ground flora ecosystems, resulting in higher stress-levels on trees and vulnerability to disease and air pollution. [12]

There is evidence to suggest that Beech trees are currently suffering as a result of climate change in south-east England, where drought is a major cause of changes in crown density. Since 1984, the Forestry Commission has recorded the crown density (assessed visually by recording the transparency or leafiness of the crown) of approximately 9000 trees per year across Britain. It was found that there is a particularly strong, negative correlation between the percentage of Beech trees with >25% crown density reduction, and average rainfall during the previous July in England and Wales.

These results were particularly relevant in 1987, 1989-1992, 1995 1997 and 2000, as in all cases, these years followed previous dry summers. Drought had impaired the development of roots and buds and increased the intensity of seed production as a response mechanism and evidence suggests that Beech is less able to control transpiration (water loss) from its leaves than species such as Oak. As a result of these studies, the thinning of crowns has become accepted as the most useful indicator of tree health.

Wetlands:

An increase in precipitation and resulting polluted water could have a detrimental impact on the Lee Valley SPA and Ramsar site. A decrease in precipitation and a resulting drop in ground water levels could have a detrimental impact on the Lee Valley SPA and Ramsar site. Approximately

12% of water bodies are unsustainably abstracted and low water flows are implicated in damaging natural water systems.

Falling water levels in the River Lee and valley waterbodies would have a direct impact on the wetland habitats and possibly, winter wildfowl and Bittern numbers. Seasonal variations in water levels caused by drought and increased abstraction, could affect marginal aquatic habitats, such as reedbeds around the periphery of the waterbodies; vital winter habitat and feeding areas for Bittern during the winter months. Reduced volumes and levels of water could result in increased concentrations of contaminants and pollution.