Appendix 3
Attributes of European Sites

This appendix contains information about the European sites scoped into the HRA. Information about each site's area, the site descriptions, qualifying features and pressures and threats are drawn from Natural England's Site Improvement Plans (SIPs)[24] and the Standard Data Forms or Ramsar Information Sheets available from the JNCC website[25]. Site conservation objectives are drawn from Natural England's website and are only available for SACs and SPAs[26].

[24] Site Improvement Plans: East of England, Natural England, http://publications.naturalengland.org.uk/category/4873023563759616
[25] JNCC Data Forms http://jncc.defra.gov.uk/default.aspx?page=4
[26] European Site Conservation Objectives, Natural England, http://www.naturalengland.org.uk/ourwork/conservation/designations/sac/conservationobjectives.aspx

Site	Summary of reasons for designation	European site pressures and threats	Conservation objectives	Non-qualifying habitats and species on which the qualifying habitats and/or species depend	Other comments
Eversden and Wimpole Woods SAC	Qualifying species: S1308 Barbastelle *Barbastella barbastellus* which is a medium sized species of bat and is one of the UK's rarest mammals. Breading season for Barbastelle bat is between April and September[27]. The site is ancient woodland of ash-maple type which is now localised and in lowland England	**Feature Location/ Extent/ Condition Unknown.** Two transects within the site are monitored each year as part of the National Bat Monitoring Programme (NBMP) however, there is some evidence that there could be other important foraging sites and other Barbastelle roosts close but not within the site. **Offsite Habitat Availability** The bats have a limited area to roost and forage within the site and it is unclear which habitats they use in the wider countryside.	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of the habitats of qualifying species; • The structure and function of the habitats of qualifying	Depends upon the maintenance of the extent, connectivity and quality of key habitat types for movement and foraging within the landscape including woodlands, treelines, linear ecological corridors such as rivers and species rich open habitats such grasslands, heathlands and wetlands.	

[27] *European Site Conservation Objectives: supplementary advice on conserving and restoring site features. Available at:* http://publications.naturalengland.org.uk/publication/6736081810620416 *Accessed 17/09/2019*

	as a whole. Eversden and Wimpole Woods is one of the largest remaining woods of its type on the chalky boulder clay in Cambridge and contains a rich assemblage of woodland plants including some uncommon species such as the Barbastelle bat *Barbastella barbastellus.* The bats use the trees as a summer maternity roost where female bats gather to give birth to their young. The woodland is also used as a foraging area by the bats and it is	Additional suitable habitat should be identified and managed long-term to improve and maintain it, in order to maintain a sustainable population. Local landowners should be given advice on how to manage important bat habitats. **Forestry and Woodland Management** The woodland the bats depends on must be maintained in medium to longer term by ensuring that tall trees, especially oak, grow up to replace those currently in place. **Air Pollution: Impact of Atmospheric Nitrogen**	species; • The supporting processes on which the habitats of qualifying species rely; • The populations of qualifying species; and • The distribution of qualifying species within the site[29].		

[29] *European Site Conservation Objectives for Eversden and Wimpole Woods Special Area of Conservation. Available at: file:///C:/Users/Buck_J/Downloads/UK0030331%20EversdenandWimpoleWoods%20SACV2018.pdf Accessed 18/09/2019*

	also a flight path when they are foraging outside the site[28].	**Deposition** Nitrogen deposition exceeds site-relevant critical loads in the ancient woodland used by Barbastelle bats as a summer maternity roost where female bats given birth and for foraging therefore, there is a risk of harmful effects on the bats[1].			
Portholme SAC	Qualifying features: H6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) The site is located in Bedford and Cambridge Claylands National Character Area	**Undesirable Species** Non-woody and woody vascular plants species may require active management to avert unwanted succession to a different and less desirable state. A species may be indicative of another negative trend relating to the sites structure or function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/ acceptable	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;	Dependent on seasonal ununddation by flood waters and therefore dependent upon the maintenance of historic conditions without notable changes in levels of pollutants, nutrients or silt	

[28] *Improvement Programme for England's Natura 2000 Sites (IPENS). Site Improvement Plan Eversden and Wimpole Wood. Available at:* file:///C:/Users/Buck_J/Downloads/SIP150512FINALv1.0%20Eversden%20&%20Wimpole%20Woods.pdf *Accessed 18/09/2019*

	(88) adjacent to the River Great Ouse south of Huntington and north-west of Godmanchester. Portholme Meadow lies over a bed of calcareous Oxford Clay deposited during the Jurassic Period 160 million years ago and can be up 70m thick in places. When the Anglian Glaciation melted, the sand and gravel washed into the river valley so under the	components or even dominants. This feature is sensitive to prolonged waterlogging. **Soils, Substrate and Nutrient Recycling** Changes in the soils natural properties may affect the ecological structure, function and processes associated with the qualifying habitat, Lowland hay meadows. Flooding for prolonged periods can cause the soil P index to increase in parts of the meadow which in turn may have a detrimental effect on the plant community. **Water Quality** The Lowland hay meadows experiences the deposition of nutrients particularly	• The extent and distribution of qualifying natural habitats; • The structure and function (including typical species) of qualifying natural habitats; and The supporting processes on which qualifying natural habitats rely[31].		

[31] *European Site Conservation Objectives for Portholme Special Area of Conservation. Available at:* file:///C:/Users/Buck_J/Downloads/UK0030054%20Portholme%20SACV2018.pdf *Accessed 18/09/2019*

	meadow is a deep bed of gravel and mixed deposits. In winter and early spring it may become inundated with flood water and the site supports grassland communities of alluvial flood meadow type[30].	phosphate and sediment in floodwaters have the potential to impact the site. **Hydrology** Serve prolonged flooding during winter at the site has previously caused a shift away from Lowland hay meadows plant community and the main issued caused is nutrients enrichment. An appropriate hydrological regime is a key step in sustaining the features and conserving objectives for this site. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic			

[30] *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Available at: file:///C:/Users/Buck_J/Downloads/UK0030054_PortholmeSAC_Formal%20Published%2011%20Jan%2019.pdf Accessed 18/09/2019*

		plants and animals present. Prolonged flooding can result in an increase in other vegetation types (such as inundation grassland, swamps). There is no control over the water levels but a ditch has been reinstated to remove flood water faster. **Adaption and Resilience to Environmental Change** Environmental change may include changes in sea levels, precipitation and temperature which are likely to affect the extent, distribution and functioning of a feature within a site. The overall vulnerability of this site to climate change has been assessed as high by Natural England (2015) which considered sensitivity, fragmentation, topography and management of the habitats and supporting habitats. Therefore, this site			

		is likely to require the most adaptation action and a site based assessment should be carried out as a priority. Action required may include reducing habitat fragmentation and minimising damage/degradation through the effects of recreational pressure. Furthermore, creating more habitat to buffer the site or expand the habitat into more varied landscapes whilst addressing specific management and condition issues will increase the sites resilience. **Air Quality** This site is sensitive to changes in air quality and air pollutants may modify the chemical status of its substrate, accelerate or damage plant growth, alter vegetation structure and composition or cause the loss of sensitive species.			

		Critical Loads and Levels are recognized thresholds above which harmful effects on sensitive UK habitats will occur at a significant level. Achieving this target may be subject to the development, effectiveness and availability of abatement technology and measures to tackle diffuse air pollution in realistic timescales.			
Devil's Dyke SAC (on FH boundary, part in FH and part in East Cambridgeshire DC) Devil's Dyke consists of a mosaic of CG3 *Bromus erectus* and CG5 *Bromus erectus – Brachypodium pinnatum* calcareous grasslands. It is the only known UK semi-natural dry grassland site for lizard orchid *Himantoglossum*	Annex I habitats: Semi-natural dry grasslands and scrubland facies on calcareous substrates (important orchid sites)	**Current pressures** Inappropriate scrub control **Potential future threats** Air pollution: impact of atmospheric nitrogen deposition. **Natural England: supplementary advice on conserving and restoring site features** In addition to the above, the supplementary advice expands on the European site's vulnerabilities as follows: • A change in the range and geographic distribution across the	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: • The extent and distribution of qualifying natural habitats; • The structure and function	The SAC's qualifying habitat relies on: • Thin, well-drained, lime-rich soils associated with chalk and limestone in low moderate altitudes. • Key structural, influential and/or distinctive species, such as grazers, surface borers, predators or to maintain the structure, function and quality of habitat. • Habitat connectivity to the wider landscape to allow for migration,	None.

hircinum.		site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. • Increases in undesirable species may result in an adverse effect on the habitats structure and function. • Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this habitat. • Air quality - exceeding critical values for air pollutants may result in changes to habitat by modifying chemical substrates, damaging plant growth, changing vegetation composition and loss of species present in these habitats.	(including typical species) of qualifying natural habitats; and • The supporting processes on which qualifying natural habitats rely.	dispersal and genetic exchange of species typical of this habitat. In particular, for species such as the Lizard orchid, *Himantoglossum hircinum*. • Active and ongoing conservation management is needed to protect, maintain or restore this habitat.	
Fenland SAC The Fenland SAC	Annex I habitats: Molinia	**Current pressures** Water pollution – nutrient	Ensure that the integrity of the site is	In general, qualifying habitats of the SAC rely	National Trust

is comprised of three fenland Sites of Special Scientific Interest: Woodwalton Fen, Wicken Fen and Chippenham Fen. Each site generally consists of standing water bodies, ditch systems, bogs, marshes and broad-leaved woodland carr.	meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) Annex II species: Spined Loach (*Cobitis taenia*), Great Crested Newt (*Triturus cristatus*)	enrichment of Chippenham Fen component, fed from a mixture of groundwater, rainfall and surface runoff. Hydrological changes related to public water supply abstraction. Air pollution: impact of atmospheric nitrogen deposition **Potential future threats** None identified. **Natural England: supplementary advice on conserving and restoring site features** In addition to the above, the supplementary advice expands on the European site's vulnerabilities as follows: • A change in the range and geographic distribution across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience	maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species; • The structure and function (including typical species) of qualifying natural habitats; • The structure and function of the habitats of qualifying species; • The supporting processes on which qualifying	on: • Key structural, influential and/or distinctive species, such as grazers, surface borers, predators or to maintain the structure, function and quality of habitat. • Habitat connectivity to the wider landscape to allow for migration, dispersal and genetic exchange of species typical of this habitat. • Active and ongoing conservation management is needed to protect, maintain or restore this habitat. For each habitat, more specific examples have been provided. *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass	undertaking remedial land management work.

		to adapt to future environmental changes. • Increases in undesirable species may result in an adverse effect on the habitats structure and function. • Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this habitat. • Poor water quality, as a result of agricultural process and inadequate quantities of water can adversely affect the structure and function of this habitat type. • Air quality - exceeding critical values for air pollutants may result in changes to habitat by modifying chemical substrates, damaging plant growth, changing vegetation composition and loss of species present in these habitats. • Increased cover of trees	natural habitats and the habitats of qualifying species rely; • The populations of qualifying species; and, The distribution of qualifying species within the site.	meadows • Upwellings and springs from the aquifer provide water to the site. • Natural hydrological processes to provide the conditions necessary to sustain this habitat. Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; Calcium-rich fen dominated by great fen sedge (saw sedge) • Upwellings and springs from the aquifer provide water to the site. • Natural hydrological processes to provide the conditions necessary to sustain this habitat. In general, the qualifying species of the SAC rely on: • The sites ecosystem as a whole (see list of	

		and shrubs can result in desiccation of these habitats. • Changes in land use on offsite habitat can result in deterioration of habitat within the SAC. • Changes in sediment may lead to sub-optimal conditions for spined loach. • Inadequate quantities of water can adversely affect the structure and function of this habitat type.		habitats below). • Maintenance of populations of species that they feed on (see list of diets below). • Habitat connectivity is important for the viability of these species populations. Spined loach • Habitat preferences – small streams, large rivers and both large and small drainage ditches with patchy cover of submerged (and possibly emergent) macrophytes. • Diet – food particles extracted from fine sediment. • Great Crested Newts Habitat preferences – requires aquatic habitat, such as ponds for breeding in areas such as pastoral and arable farmland, woodland	

				and grassland. • Diet – aquatic invertebrates.	
Ouse Washes SAC, SPA and Ramsar site An extensive area of seasonally flooding wet grassland ('washland') with a diverse and rich ditch fauna and flora located on a major tributary of The Wash. The washlands support both breeding and wintering waterbirds.	SAC qualifying species Annex II: Spined loach *Cobitis taenia* SPA qualifying species Article 4.1, Annex 1 species (breeding season): Ruff *Philomachus pugnax;* Spotted Crake *Porzana porzana* Annex I species (over winter): Bewick's Swan *Cygnus columbianus bewickii*; Hen Harrier *Circus cyaneus*; Ruff *Philomachus pugnax*;	**Current pressures** Inappropriate water levels – interest features are being adversely affected by increased flooding. **Potential future threats** Water pollution.	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving… - the Favourable Conservation Status of its Qualifying Features (SAC), or - the aims of the Wild Birds Directive (SPA) …by maintaining or restoring: • The extent and distribution of the habitats of qualifying species/features • The structure and function of the habitats of the qualifying	In general, the qualifying species of the SAC, SPA and Ramsar rely on: • The sites ecosystem as a whole (see list of habitats below). • Maintenance of populations of species that they feed on (see list of diets below). • Habitat connectivity is important for the viability of this species population. Spined loach • Habitat preferences – small streams, large rivers and both large and small drainage ditches with patchy cover of submerged (and possibly emergent) macrophytes. • Diet – food particles	Long term tidal strategy - regular problems summer flooding- severe siltation of Great Ouse River. Smaller watercourses could drain into Great Ouse River and to Ouse Washes SPA/SAC. Large land holdings by RSPB, Cambridgeshire

	Whooper Swan *Cygnus cygnus,* Article 4.2 (migratory species – breeding season): Black-tailed Godwit *Limosa limosa limosa*; Gadwall *Anas strepera*; Shoveler *Anas clypeata* Article 4.2 (migratory species – over winter): Black-tailed Godwit *Limosa limosa islandica;* Gadwall *Anas strepera;* Pintail *Anas acuta;* Pochard *Aythya farina;* Shoveler *Anas clypeata;* Wigeon *Anas Penelope* Article 4.2 Assemblage		species/features • The supporting processes on which the habitats of qualifying species/features rely • The populations of qualifying species/features, and, • The distribution of qualifying species/features within the site.	extracted from fine sediment. In general, the qualifying bird species of the SAC, SPA and Ramsar rely on: • The sites ecosystem as a whole (see list of habitats below). • Maintenance of populations of species that they feed on (see list of diets below). • Off-site habitat, which provide foraging habitat for these species. • Open landscape with unobstructed line of sight within nesting, foraging or roosting habitat. Ruff • Habitat preferences – grassy tundra, lakes, farmland, on migration mudflat. • Diet – invertebrates, especially insects, some plant material	Wildlife Trust and Wetlands and Wildfowl Trust.

	qualification: regularly supports at least 20,000 waterfowl <u>Ramsar criteria</u> 1. Extensive area of seasonally-flooding washland 2. Nationally scarce aquatic plants, relict invertebrates, assemblage of nationally rare breeding waterfowl. 5. Bird assemblages of international importance. 6. Water birds for potential future consideration			Spotted Crake • Habitat preferences – swamps and marsh. • Diet – small aquatic invertebrates, parts of aquatic plants. Bewick's Swan • Habitat preferences – lakes, ponds and rivers, also estuaries on migration. • Diet – plant material in water and flooded pasture. Hen Harrier • Habitat preferences – moor, marsh, steppe and fields. • Diet – mostly, small birds, nestlings and small rodents. Whooper Swan • Habitat preferences – lakes, marshes & rivers. • Diet – aquatic vegetation also grazes on land.	

				Black-tailed Godwit • Habitat preferences – marshy grassland and steppe, on migration mudflats. • Diet – invertebrates, some plant material. Gadwall • Habitat preferences – marshes, lakes, on migration also rivers, estuaries. • Diet – Leaves, shoots. Pintail • Habitat preferences – lakes, rivers and marsh. • Diet – omnivorous, feeds on mud bottom at depths of 10-30cm. Pochard • Habitat preferences – lakes and slow rivers on migration also estuaries. • Diet – mostly plant material, also small animals.	

				Shoveler • Habitat preferences – shallow lakes, marsh, reedbed and wet meadow. • Diet – omnivorous, especially small insects, crustaceans, molluscs and seeds. Wigeon • Habitat preferences – marsh, lakes, open moor, on migration also estuaries. • Diet – mostly leaves, shoots, rhizomes and some seeds.	
Chippenham Fen Ramsar	Criterion 1: Spring-fed calcareous basin mire with a long history of management, which is partly reflected in the diversity of present-day vegetation. Criterion 2: The invertebrate	Pressures and threats documented in the Fenland SAC Site Improvement Plan relate to the designated features of the SAC (see above) but are also likely to be relevant to the designated Ramsar features, particularly hydrological changes which are cited in the Ramsar Information Sheet.	Not applicable.	In general, the qualifying habitats of the Ramsar rely on: • Key structural, influential and/or distinctive species, such as grazers, surface borers, predators to maintain the structure, function and quality of habitat. • Insect, such as bees	Inappropriate scrub control, cutting and mowing in several units contributing to unfavourable no change

	fauna is very rich, partly due to its transitional position between Fenland and Breckland. The species list is very long, including many rare and scarce invertebrates characteristic of ancient fenland sites in Britain. Criterion 3: The site supports diverse vegetation types, rare and scarce plants. The site is the stronghold of Cambridge milk parsley (*Selinum carvifolia*).			and flies for pollination of flowering plants. • Habitat connectivity to the wider landscape to allow for migration, dispersal and genetic exchange of species typical of this habitat. • Management of habitats to protect, maintain and restore it. In general, the qualifying species of the Ramsar rely on: Invertebrates • Diets – flowering plants, organic matter and other invertebrate species for food resources.	status.
Wicken Fen Ramsar	Criterion 1: One of the most outstanding remnants of the East Anglian	Pressures and threats documented in the Fenland Site Improvement Plan relate to the designated features of the	Not applicable.	In general, the qualifying habitats of the Ramsar rely on: • Key structural, influential and/or	Issues caused by inappropriate water

	peat fens. The area is one of the few which has not been drained. Traditional management has created a mosaic of habitats from open water to sedge and litter fields. Criterion 2: The site supports one species of British Red Data Book plant, fen violet (*Viola persicifolia*), which survives at only two other sites in Britain. It also contains eight nationally scarce plants and 121 British Red Data Book invertebrates.	SAC (see above) but are also likely to be relevant to the designated Ramsar features, particularly hydrological changes which are cited in the Ramsar Information Sheet.		distinctive species, such as grazers, surface borers, predators to maintain the structure, function and quality of habitat. • Insect, such as bees and flies for pollination of flowering plants. • Habitat connectivity to the wider landscape to allow for migration, dispersal and genetic exchange of species typical of this habitat. • Management of habitats to protect, maintain and restore it. In general, the qualifying habitats of the Ramsar rely on: Invertebrates • Diets – flowering plants, organic matter and other invertebrate species for food resources.	levels and scrub control in some areas. WLMP in place to address these issues.