

love every drop
anglianwater



ANGLIAN WATER BIODIVERSITY STRATEGY



FOREWORD

A healthy natural environment is the foundation of a strong economy and prospering communities. We rely on the environment to provide the 1.2 billion litres of water we supply to customers every day, so we recognise that we have an important role to play in safeguarding it.

This Biodiversity Strategy sets out what we'll do to protect and enhance wildlife, on our own land at places like Rutland Water and across the region in and around the communities we serve.

The strategy is aligned with what our customers and stakeholders have told us, and also shows how we will contribute to national nature conservation targets set out by the government in 'Biodiversity 2020'.

By taking action for wildlife and wild spaces we can play our part in creating a flourishing environment, ensuring our region remains a great place to live, work, and visit.

Peter Simpson

Peter Simpson
Chief Executive



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our Guiding
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INTRODUCTION

ANGLIAN WATER SUPPLIES WATER AND WATER RECYCLING SERVICES TO OVER SIX MILLION DOMESTIC AND BUSINESS CUSTOMERS ACROSS THE EAST OF ENGLAND AND HARTLEPOOL. THE REGION WE SERVE COVERS 27,500 KM² – THE LARGEST GEOGRAPHICAL AREA OF ANY WATER COMPANY IN ENGLAND AND WALES.



RUTLAND WATER LAGOONS

The services we provide are inextricably linked to the natural environment. We take water from rivers and aquifers, and we return treated water back to the environment. We have significant assets across the region, including globally or nationally important wildlife habitats such as Rutland Water. We also rely on the natural environment to help maintain water quality and quantity. For these reasons it's important we play our part to protect the natural environment within our region.



This plan has been informed by consultation with stakeholders including local Wildlife Trusts, RSPB, Keep Britain Tidy, the Environment Agency and Natural England. It outlines our strategy for conserving biodiversity across the East of England, meeting our legal obligations and contributing to the England biodiversity strategy set out in 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services'. It will also help us achieve our Business Plan outcome of 'A Flourishing Environment'.

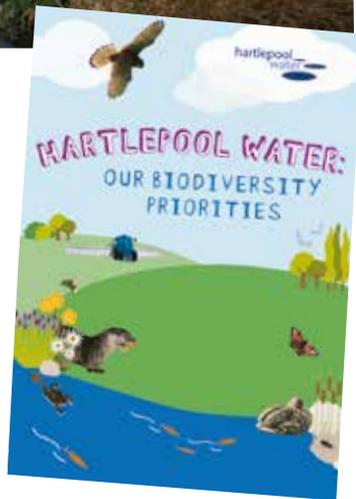


A FLOURISHING ENVIRONMENT FOR NATURE AND FOR EVERYONE.

A good outcome will be...

The environment in our region flourishes. Rivers, lakes, aquifers and coastal waters support a rich biodiversity, contribute to a growing economy and provide a valuable amenity for families and communities. There is joined-up, effective and collaborative management of the water cycle in our catchments (an area drained by a river) from source to tap and back to the environment. Our activities are sensitive to environmental needs and risks, and adverse impacts are avoided. People, businesses, water- and land-users in our region are engaged in the challenges of maintaining a sustainable environment. All legal requirements are met.

From 'Our Plan 2015-2020' http://www.anglianwater.co.uk/_assets/media/ICT_Final.pdf



The Biodiversity Strategy for Hartlepool Water is outlined in 'Hartlepool Water: Our Biodiversity Priorities', which can be found on the Hartlepool Water website <http://www.hartlepoolwater.co.uk/environment/index.aspx>

WHAT IS BIODIVERSITY?

BIODIVERSITY IS THE VARIETY OF ALL LIFE ON EARTH. IT INCLUDES EVERYTHING THAT IS ALIVE ON OUR PLANET – ALL SPECIES OF ANIMALS AND PLANTS AS WELL AS GENETIC VARIETY WITHIN SPECIES. BIODIVERSITY IS IMPORTANT FOR ITS OWN SAKE, AND HUMAN SURVIVAL DEPENDS UPON IT.

Amended from 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' (Defra, 2011)

WHY IS BIODIVERSITY IMPORTANT?

Our region's biodiversity is important and unless we look after it the benefits it provides us will be diminished.

The natural environment provides all sorts of services we rely on. Bees and other insects pollinate our crops with an estimated value of £430 million to the UK. Birds, mammals and insects act as natural pest controllers. The region's diverse biodiversity and landscapes also make it an attractive place to live, work and visit, creating

significant value through tourism, recreation, health and well-being.

As a water company we benefit when wildlife habitats such as woodlands and wetlands help keep water clean by removing sediment and other contaminants, or slow its movement though the catchment to prevent flooding. We even rely on nature to help treat our used water before it goes back into the environment.

We believe a healthy, properly functioning natural environment is the foundation of sustained economic growth, prospering communities and personal well-being. Therefore, it is important that we play our part in helping to protect and enhance our regional environment.



THREATS AND CHALLENGES



DESPITE THE IMPORTANCE OF BIODIVERSITY AND THE VALUE IT PROVIDES, OUR REGION HAS EXPERIENCED HABITAT LOSS AND MANY SPECIES ARE MUCH LESS WIDESPREAD THAN THEY ONCE WERE.

SOME SPECIES HAVE BECOME EXTINCT, WHILE OTHERS HAVE BEEN INTRODUCED BY HUMAN ACTIVITY AND HAVE BECOME INVASIVE, LEADING TO ECONOMIC AND ENVIRONMENTAL IMPACTS.

HABITAT LOSS AND NEGLECT

Habitat loss can occur as a result of a variety of pressures such as development, agricultural intensification and climate change. The loss of habitat leads to the fragmentation and isolation of remaining habitat patches. This reduces species' ability to move in the landscape and increases the threat of local extinctions.

Our landscape has been influenced and shaped over millennia by humans. Many of our valuable habitats require active management in order to support a variety of species and thereby maintain biodiversity. Neglect or inappropriate management can lead to reduced habitat quality over time.



WOOD STACKS

INVASIVE NON-NATIVE SPECIES

There are about 2,000 such species in the UK and about 10-15% of them cause significant social, environmental or economic impacts. Species of particular concern for Anglian Water include:

- Zebra mussel *Dreissena polymorpha* and Quagga mussel *Dreissena bugensis*, which foul water intake pipes leading to increased pumping and cleaning costs
- Killer shrimp *Dikerogammarus villosus*, and Demon shrimp *Dikerogammarus haemobaphes* which is a voracious predator of native invertebrates and fish
- Japanese knotweed *Fallopia japonica* which can do costly harm to built assets by breaking through tarmac and cement



HIMALAYAN BALSAM

- Himalayan balsam *Impatiens glandulifera* which dies back in the winter leaving the river banks prone to erosion, reducing water quality
- Giant hogweed *Heracleum mantegazzianum* which is a human health risk. Contact with the plant, particularly the sap, can lead to severe blistering and scarring.



KILLER SHRIMP

Other species of concern are those that could cause a flood, abstraction and recreation risk by clogging up waterways. Species include Water primrose *Ludwigia grandiflora* and Floating pennywort *Hydrocotyle ranunculoides*.

UNSUSTAINABLE ABSTRACTION



Sustainable abstraction is key to maintaining a reliable water supply for all users and ensuring there is enough water left for the needs of the environment. Over-abstraction can lead to low flows in rivers, loss of wetland habitat, increased sedimentation, impeded fish migration and saline intrusion.

The Environment Agency (EA) licenses and regulates water abstraction and each catchment is assessed individually on the amount of water available for abstraction from all water resources through Catchment

Abstraction Management Strategies (CAMS).

Anglian Water abstracts approximately half of its water directly from surface water sources and the other half from groundwater sources. Other abstractors include farmers, industry and energy generators.

We work closely with the Environment Agency to reduce unsustainable abstractions (where there is clear evidence that they are causing harm), and work closely with Defra and others to inform abstraction reform.

POLLUTION

Pollution of natural habitats can occur both directly and indirectly in a variety of ways.

Intensive agricultural practices can lead to the drift of pesticides onto neighbouring habitats and airborne pollutants from industry, cars and urban areas are deposited onto soils and plants.

Ponds, lakes, reservoirs and rivers are impacted by agricultural run-off, sediment run-off, pollution from roads, and occasionally from sewer overflows and incidents at water recycling centres.

Litter also constitutes pollution to the natural environment. The RiverCare and BeachCare programmes, which is funded by us and delivered by Keep Britain Tidy, allows community groups to take ownership of their local stretch of river or beach where they undertake litter picking as well as other activities such as biodiversity surveys and Himalayan balsam *Impatiens glandulifera* control.



CLIMATE CHANGE

Changes in plant and animal behaviour have been recorded and linked to changes in weather and climate.

EXAMPLES INCLUDE:

- Species occurring further north
- Warmer springs causing life-cycle events of many species to occur earlier in the season, such as the arrival of spring migrating birds
- Species populations and habitats have been affected by year-to-year variations in rainfall and extreme weather events, particularly droughts. (NERC, 2015)

The distribution of native species is expanding northwards or advancing in altitude. Some species may be unable to maintain pace with changing temperatures and those at



HIGHLAND CATTLE



SWALLOW

the limits of their northerly or altitudinal range could become extinct.

Habitat damage could result from extreme weather events, such as flooding, droughts and wild fires.

The resilience of wildlife to climate change will be enhanced through good habitat management, introducing microclimate variability and improving connectivity at a landscape scale.



PITSFORD WATER DROUGHT

LEGISLATION & POLICY

LAWS AND POLICIES HAVE BEEN INTRODUCED TO REVERSE THE DECLINE OF HABITATS AND SPECIES.

Legal background

Legal protection is given to habitats and species in England and Wales by legislation such as the Conservation of Habitats and Species Regulations 2010, the Wildlife and Countryside Act 1981 (as amended), the Protection of Badgers Act 1992 and the Hedgerow Regulations 1997, among others.



WATER VOLE

This has resulted in:

- A network of protected sites called Sites of Special Scientific Interest (SSSI). Anglian Water has responsibility for 47 across the region, covering nearly 3,000 hectares of land. Examples include Rutland Water, Dereham Rush Meadow, Tetney Blow Wells and Newbourne Springs. We have a legal duty to maintain these sites in 'favourable condition'. At the end of March 2016 98.9% of our SSSIs by area were in favourable condition and 99.9% in favourable or unfavourable recovering condition
- A number of SSSIs being given extra protection because of their value at a European or international level. The sites are also designated as Special Protection Areas (SPA), Special Areas of Conservation (SAC) or Ramsar sites. Examples include Rutland Water and Taverham Mill
- A large number of protected species, which we must not harm in the construction and operation of our assets. Examples include bats, Water vole *Arvicola amphibius*, Great crested newts *Triturus cristatus* and birds during the nesting season.



BADGER



We are committed to managing our Sites of Special Scientific Interest in such a way to move them to, and maintain them in favourable condition.



Additionally, under the Natural Environment and Rural Communities (NERC) Act 2006, Anglian Water has a duty to have regard to the conservation of biodiversity in exercising its functions. The duty, called the **biodiversity duty**, aims to raise the profile and visibility of biodiversity, clarify existing

commitments with regard to biodiversity, and to make it an integral part of policy and decision-making. The biodiversity duty relates to habitats and species of principal importance, many of which are found on our operational assets. Some of our operational sites will be designated as Local Wildlife Sites (LWS). These will be the best examples of priority habitats that we own and should be managed in a way that conserves their interest.

We are committed to complying with all nature conservation legislation. Doing so helps us meet our Flourishing Environment outcome and No Incidents goal.



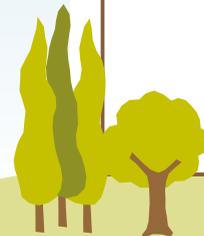
We are committed to delivering our biodiversity duty, for example by identifying and managing important areas of wildlife habitat on our landholdings.



SITE DESIGNATIONS EXPLAINED

MANY OF OUR ASSETS ARE VALUABLE ENOUGH FOR WILDLIFE TO BE PROTECTED BY LAW OR LOCAL PLANNING POLICY. HERE'S A QUICK GUIDE:

DESIGNATION	EXPLANATION	EXAMPLES
Ramsar	Ramsar sites are wetlands of international importance designated under the Ramsar Convention.	Rutland Water
Special Area of Conservation (SAC)	Sites protected under the EC Habitats Directive. Designed to protect high-quality habitats and rare and vulnerable species.	Taverham Mill
Special Protection Area (SPA)	Sites protected in accordance with Article 4 of the EC Birds Directive. Designed to protect rare and vulnerable birds.	Rutland Water
Sites of Special Scientific Interest (SSSI)	Sites protected under the Wildlife and Countryside Act (1981). Designed to protect the best example of wildlife habitat in the UK.	Tetney Blow Wells, Newbourne Springs, Dereham Rush Meadow, Pitsford Water, Grafham Water
Local Wildlife Sites (LWS)	Sites of local importance for wildlife and likely to contain priority habitats protected by the Natural Environment and Rural Communities (NERC) Act. Designated mostly by Local Wildlife Site partnerships. Protected from development by planning policy.	Ravensthorpe Reservoir, Hollowell Reservoir, Elsham Chalk Quarry, Marham Fen, River Witham and Saltersford Valley





BIODIVERSITY 2020

In response to international commitments to protecting biodiversity, the UK government published 'Biodiversity 2020: A Strategy for England's wildlife and ecosystem services'. The main objective of the strategy is "to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people" to be achieved by 2020.

Implementing the strategy requires the commitment of all sectors of society, including government, businesses, charities, statutory organisations and academic institutions.



BANDED DEMOISELLE

Biodiversity 2020 succeeds the UK Biodiversity Action Plan. When reference is now made to 'priority' habitats and species, this refers to those identified as being of Principal Importance in England as defined under Section 41 of the NERC Act 2006.

This nature strategy is our contribution to meeting Biodiversity 2020 objectives.



WHAT OUR CUSTOMERS AND STAKEHOLDERS SAY

IN PREPARING OUR BUSINESS PLAN FOR 2015-2020 WE HELD THE BIGGEST CONSULTATION WE HAVE EVER HAD WITH OUR CUSTOMERS.

We found out that while some customers are strongly supportive of the company's environmental work, others feel it is less important than providing the core service and tackling leaks.

However, on average, evidence suggests household and non-household customers across the Anglian Water region are willing to pay for environmental performance. Though customers find it difficult to comment on legal standards, there seems to be strongest support for going beyond these where there are clear economic benefits for local people (and/or doing so does not increase bills substantially) (Anglian Water, 2013).

Some qualitative research and engagement activities suggest loss of biodiversity and natural habitats may be less of a priority than other environmental issues (such as water pollution or climate change). That said, reducing pollution and improving rivers and canals for wildlife is customers' top priority for improving the local water environment.





TETNEY BLOW WELLS

Our wider stakeholders include environmental regulators such as the Environment Agency and environmental charities such as local Wildlife Trusts and the RSPB. Among other things, they told us that:

- We should manage all important habitats on our own landholdings, especially our SSSIs and LWSs
- We should prioritise high-quality sites, those that contribute to functioning ecological networks, where there are landscape-scale projects being undertaken and/or where we have significant operational activities
- In the wider countryside, our focus should be on wetland habitats
- We should work in partnership with others

Our existing projects, such as Water for Wildlife, RiverCare and BeachCare, are aligned with this feedback. They are projects focusing on local watercourses and wetlands, protecting biodiversity and encouraging volunteer involvement. They are projects being delivered in partnership with charitable organisations.

We will seek to work with others to cost-effectively achieve shared environmental objectives.



REDUCING OPERATIONAL IMPACTS ON THE ENVIRONMENT

TO PROVIDE OUR CUSTOMERS WITH WATER AND WATER RECYCLING SERVICES WE HAVE TO ABSTRACT WATER FROM THE ENVIRONMENT.

We then have to treat used water and return it to rivers across the region. Using robust evidence, we work with the Environment Agency to identify where our operational assets may be having an impact on the environment. We then agree affordable measures that can help meet European and national Water Framework Directive targets.



HALL WATER RESERVOIR

During the current business planning period 2015-2020 we'll be investing to deliver a range of environmental improvements. These will have direct or indirect benefits for habitats and species across the region.

- Abstraction reduction on the River Wensum, North Norfolk coast and Coston Fen
- Implementing habitat restoration measures to mitigate the impact of our abstraction on the River Nar in Norfolk and Laceby Beck and Skitter Beck in Lincolnshire
- Ongoing investigations to better understand our abstraction impact on selected watercourses across the region
- Catchment management to reduce the costs and environmental impact of treatment to remove pesticides and nitrate from raw water, and working in collaboration with other stakeholders on the catchment-based approach
- Reducing the amount of phosphate and ammonia being discharged at selected water recycling centres across the region
- Installation of screens and passes to support the recovery of Eel populations and investigations to assess Eel populations in our reservoirs
- Investigating which measures may be necessary to meet higher standards in the revised Bathing Water Directive.



OUR COMMITMENTS



TAKING ACCOUNT OF OUR CUSTOMERS' AND STAKEHOLDERS' VIEWS, WE WILL MEET OUR LEGAL OBLIGATIONS AND PLAY OUR PART IN RESTORING NATURE IN THE FOLLOWING WAYS:

BIODIVERSITY 2020 OUTCOME	ANGLIAN WATER'S COMMITMENT
<p>1A. Better wildlife habitats with 90% of priority habitats in favourable or recovering condition and at least 50% of SSSIs in favourable condition, while maintaining at least 95% in favourable or recovering condition.</p>	<p>We will continue to bring our SSSIs into favourable condition to meet the 50% and 95% targets and exceed them where possible, as is our legal duty.</p> <p>We will identify priority habitats on our land and work with operational colleagues to implement appropriate management.</p>
<p>1B. More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000 ha.</p>	<p>Where we have to prioritise our sites we will focus on those that can contribute the most to restoring functioning ecological networks.</p> <p>We will support the creation of new priority habitats through partnership projects such as Water for Wildlife, RiverCare and BeachCare and through the creation of a grant scheme.</p>
<p>1C. By 2020, at least 17% of land and inland water, especially areas of particular importance for biodiversity and ecosystem services, will be conserved through effective, integrated and joined-up approaches to safeguard biodiversity and ecosystem services, including through management of our existing systems of protected areas and the establishment of nature improvement areas.</p>	<p>We will identify landscape-scale projects across our region and identify what role our landholdings could play in delivering project targets. We will implement measures where we can do so effectively within the resources available.</p>

BIODIVERSITY 2020 OUTCOME	ANGLIAN WATER'S COMMITMENT
<p>1D. Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaptation.</p>	<p>We will contribute to this target through the habitat creation and restoration work undertaken on our land or through projects such as Water for Wildlife, RiverCare and BeachCare.</p>
<p>3. By 2020, we will see an overall improvement in the status of our wildlife and will have prevented further human-induced extinctions of known threatened species.</p>	<p>We will take action to protect and enhance priority species during the construction and operation of our assets.</p> <p>We will work with Buglife to identify if any of our sites could make a significant contribution to protecting pollinating insects, for example by providing nectar-rich plants.</p> <p>We will identify sites that by their location and size could make a meaningful contribution to the conservation of farmland birds, for example by providing summer insect food, a winter seed source and habitats for nesting.</p> <p>If resources allow we will consider supporting species projects in our region, especially where they are aligned with other priorities.</p>
<p>4. By 2020, significantly more people will be engaged in biodiversity issues, aware of its value and taking positive action.</p>	<p>We will encourage the active involvement of operational staff in protecting biodiversity. We will support public access and environmental awareness on our recreational sites.</p>

EVERYONE IN OUR COMPANY HAS A ROLE TO PLAY IN PROTECTING THE ENVIRONMENT



ACTIONS

Operational Sites

- 1 Continue to invest in our own SSSIs to bring them into and maintain them in favourable condition
- 2 Identify operational sites designated as Local Wildlife Sites (LWS) in order to bring into favourable condition. All operational LWS to have management prescriptions by March 2018
- 3 Investigate the feasibility of implementing a net biodiversity gain policy for operational sites by March 2019
- 4 Identify location and extent of priority habitats on operational sites, screen against criteria such as size, proximity to protected sites, landscape-scale conservation projects, species priority areas by March 2020. Develop management prescriptions for key sites in AMP7
- 5 Identify sites within the B-Lines network where action to support pollinating insects can be undertaken. March 2020
- 6 Identify sites across the region where action to support farmland birds can be undertaken. March 2020
- 7 Support operational staff to ensure compliance with protected species legislation and implement management prescriptions for biodiversity
- 8 Continue to develop and support a network of

Biodiversity Champions among operational staff, to support and encourage nature conservation on our landholdings

- 9 Where feasible, eradicate or prevent the spread of invasive non-native species
- 10 Maintain existing network of successful Barn owl *Tyto alba* boxes on AW sites
- 11 Explore the potential of AW water towers and similar assets to provide Peregrine falcon *Falco peregrinus* nesting sites to support their range expansion, where this does not impact upon our operations
- 12 Conserve or mitigate impacts upon priority species where found on our sites

Wider countryside

- 1 Continue to support RiverCare, BeachCare and Water for Wildlife through to March 2020
- 2 Launch a grant scheme to provide funds for wetland habitat and species conservation projects in 2016.
- 3 Support the mapping of B-Lines across the Anglian Water Region. 2015/16
- 4 Continue support for the Pool frog project through to March 2020
- 5 Support catchment and coastal advisors to enable them to provide advice that delivers biodiversity benefits

CASE STUDY



ENGAGING OUR OPERATIONAL STAFF

Every employee has a role to play in helping Anglian Water create a Flourishing Environment. This is particularly relevant to the colleagues who work on our operational sites.

We have created a network of Biodiversity Champions in Water and Water Recycling Services who provide support and information to operational teams. Biodiversity Champions take on responsibility for delivering management and enhancing biodiversity within their operational areas under guidance from the Biodiversity Team. The role forms part of their professional development and they gain transferable and conservation-related knowledge and skills.

Biodiversity Champion Steve Coles, a Process Controller in Water Services, is leading a

grassland enhancement project at Wing Water Treatment Works (WTW) in Leicestershire. The grassland at the site was maintained as regularly mown amenity grassland with little biodiversity value. Biodiversity gains have been achieved by changing the management regime and enhancing the seed bank through spreading green hay collected from a nearby nature reserve. Steve has grown his skills in project management and developed an understanding of grassland management techniques by leading this work.

Furthermore, Steve has used his experience as a Biodiversity Champion to demonstrate his commitment to the environment in order to become the first ever Registered Environmental Technician with the Society for the Environment.

HABITATS

THE FOLLOWING PAGES DESCRIBE SOME OF THE IMPORTANT HABITATS FOUND ON OR AROUND ANGLIAN WATER SITES. THE BEST EXAMPLES WILL BE PROTECTED AS SITES OF SPECIAL SCIENTIFIC INTEREST OR LOCAL WILDLIFE SITES. OTHERS, WHILE NOT DESIGNATED, SHOULD STILL BE MANAGED AS PART OF OUR BIODIVERSITY DUTY (SEE PAGE 12).

ARABLE FIELD MARGINS

This habitat comprises the uncultivated margin of a field around the edge of a crop. It may be managed as a low-input system for the establishment of plants adapted to this habitat, planted with heavily seeding species as wild bird cover, planted with valuable pollen and nectar forage species or used as a strip to buffer an adjoining habitat such as a river.

Many plants that were once characteristic of uncultivated field margins are now rare or extinct, such as Corn-cockle *Agrostemma githago* and Corn marigold *Chrysanthemum segetum*.

Arable field margins provide many benefits, including the provision of habitat for important crop pollinators and species that play an integral role in biological pest control, linkages between



BARN OWL

other habitats, a physical wind-break that prevents damage to crops from extreme weather and a method of controlling soil erosion along watercourses.

A number of bird species associated with farmland have seen significant declines due to the intensification of agriculture over recent decades. Many of these have been affected due to the creation of larger field systems resulting in the loss of nesting and foraging habitats, the change to winter sown crops from spring sown crops diminishing winter stubbles as foraging habitats, pesticide use reducing invertebrate availability and cultivation to the very edges of fields minimising the availability of cereal weed seeds. For Kestrels *Falco tinnunculus* and Barn owls, arable field margins provide habitats and landscape connections for prey items, including mice, voles and shrews and thus are able to support more territories across the landscape.



PRIORITY HEDGEROWS

Hedgerows provide essential networks across the landscape by connecting fragmented habitats as well as providing a habitat resource in their own right. Priority hedgerows include those that are defined as ancient hedgerows predating the Enclosure period of 1720 – 1840, species-rich hedgerows that comprise five or more woody species within a 30 metre length as well as supporting a rich and diverse ground flora, and hedgerows of which at least 80% of their composition is made up of at least one native woody tree or shrub species. Legislative protection is afforded through the Hedgerow Regulations 1997.

Implementing appropriate management, planting new hedgerows and filling-in gaps within existing hedgerows across our assets will provide linkages between other existing habitats and provide nesting and foraging opportunities for a variety of bird species, including Turtle dove, which has declined significantly across England since the late 1970s.



HEDGEROW

The flora that establishes at the base of a hedge is equally as important and certain bird species, such as Yellowhammer *Emberiza citrinella*, Grey partridge *Perdix perdix* and Song thrush *Turdus philomelos*, will nest on or near to the ground where suitable.

The connections that are formed across the landscape and between different habitats by hedgerows provide commuting corridors for reptiles, amphibians, small mammals and bat species.

STREAMS AND RIVERS

Rivers provide habitats for a wide variety of plants and animals, both within the watercourse and also along the river bank.

Riverside habitats associated with watercourses support wetland species such as Otter *Lutra lutra* and Water vole *Arvicola amphibious*. The in-channel habitats are important for declining species, including White-clawed crayfish *Austropotamobius pallipes*, Bullhead *Cottus gobio* and European eel *Anguilla Anguilla*. Invasive species spread easily along rivers and streams and the invasive Himalayan balsam is an example of one that has spread extensively along the river corridors in the region.

Chalk rivers are characterised by lush growth of Water-crowfoot *Ranunculus spp.*, Starworts *Callitriche spp.*, Watercress *Rorippa spp.* and Lesser water parsnip *Berula erecta*. They are fed from groundwater chalk aquifers. There are only a few hundred chalk streams in the world and about 85% of them are found in the south and east of England. The River Wensum, where Taverham Mill is located, is designated as a SAC for its chalk stream habitat.



WHITE-CLAWED
CRAYFISH





NEUTRAL GRASSLAND

NEUTRAL GRASSLAND

NEUTRAL GRASSLAND SUPPORTS A PLANT COMMUNITY THAT FORMS ON SOILS THAT ARE NOT TOO ACIDIC OR ALKALINE. THEY ARE GENERALLY FOUND IN LOWLANDS AND MAY INCLUDE WET GRASSLANDS.

Much of the neutral grassland throughout England has been agriculturally improved in the past to increase yield and this equally applies across the Anglian Water region.

These grasslands were traditionally managed as hay meadows and grazing pastures. By implementing a similar management regime today, the species richness of neutral grasslands can be maintained.

Well-managed and floristically rich grasslands support a diverse assemblage of invertebrates and in particular, pollinating insects. These provide a key service pollinating crops and wildflowers, in addition to providing a food source to other wildlife. Other types of grassland include:

Lowland Dry Acid Grassland

This habitat occurs on nutrient-poor, free-draining soils with a pH of 4-5.5, below 300m

altitude and is usually managed as pasture.

Lowland Calcareous Grassland

This habitat develops on shallow lime rich soils; they are usually grazed and sometimes cut for hay.

LOWLAND HEATHLAND

This habitat is characterised by the presence of heather and gorse species.

They are characteristically found on acidic, sandy, free-draining soils that are nutrient poor and below 300m in altitude.

Since 1800 over 80% of the heathland resource has been lost due to agricultural improvement, housing and roads, and encroachment of scrub and trees.

The most significant areas for heathland in our region are in Breckland, and along the Suffolk coast.

WET WOODLAND

In Anglian Water's area this habitat usually occurs on poorly drained soils or seasonally wet soils in floodplains, along streams or as successional habitats on fens. They are affected by clearance, lowering of water tables, overgrazing, river canalisation, poor water quality from eutrophication, industrial effluents or rubbish dumping and invasion of non-native species such as Himalayan balsam.



HIMALAYAN BALSAM

FENS

Fens are peatlands that receive water from the ground as well as from rain water and river flooding. They are part of a complex of wetland habitats including reedbeds, swamp and marshes. Since 1945, lowland fens have been lost as a result of drainage and conversion to agricultural land, over-abstraction leading to drying out and scrub encroachment, and agricultural run-off causing enrichment and changes in plant communities.



NIGHTINGALE

LOWLAND MIXED DECIDUOUS WOODLAND

Ancient woodlands are those that have existed continuously since 1600. They have undisturbed soils and comprise mixed native trees and shrubs and open areas.

Well-managed woodland habitats support a wide variety of specialist and generalist species, including birds, small mammals, invertebrates and bats. Traditional management techniques such as coppicing have declined, leading to a drop in habitat quality.



WOODWALTON FEN



PONDS

Ponds are defined as permanent water bodies up to two hectares in extent and seasonal standing water bodies which usually hold water for up to four months of the year. The quality and quantity of ponds in the country has declined as their economic functions of providing water for livestock, clay for housing or soil improvement ceased in many areas. Urban development and intensification of agriculture has also contributed to their decline. BAP Priority Habitat Ponds must meet one or more additional criteria such as supporting Red Data Book, UK BAP or other fully protected species.

REEDBEDS

Reedbeds are a type of fen community dominated by Common reed *Phragmites australis*. Many have been lost due to water abstraction, land drainage, conversion to agriculture or lack of management leading to scrub invasion. They are important breeding areas for a number of rare birds.

EUTROPHIC STANDING WATERS

These are still waters such as lakes, reservoirs and gravel pits, which are rich in plant nutrients. They are characterised by having dense populations of algae in midsummer and beds covered by dark anaerobic mud, rich in organic matter. Depending on age and management they can be fringed with reeds, sweet-grass and other emergent plants or willow scrub. They support a diverse ecology, including fish, amphibians, invertebrates and breeding birds.

OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND

This habitat comprises patches of bare ground with plants able to grow on thin soils, more established open grasslands with herbs, scrub and patches of other habitat such as heathland, woodland, swamp, ephemeral pools and inundation grasslands. Such complex habitats develop in places such as disused quarries and post-industrial sites. They may also be found in a small quantity on our operational sites.

COASTAL HABITATS

1,200km of coastline marks the eastern boundary of the Anglian Water region. Priority coastal habitats include saltmarsh, vegetated shingle, intertidal mudflats and saline lagoons. Some of these priority habitats are present on Anglian Water land assets and examples include Stannet's Creek lagoon in Essex, part of the Crouch and Roach Estuary SSSI and SAC, and a section of Tilbury Marshes LWS at Tilbury Water Recycling Centre.



GREY SEALS

breeding colonies of Grey seal *Halichoerus grypus* in the UK. Coastal habitats play an important role in protecting much of our low-lying region from tidal surges, but are susceptible to coastal squeeze as a result of management and development pressures and the effects of climate change.

Our commitment to identify and manage priority habitat on our land is equally applicable to the coastal habitats that we have a responsibility for.



COMMON SEAL

These coastal habitats support important species such as Sandwich tern *Sterna sandvicensis* and the largest



APPENDIX

THE LIST BELOW OUTLINES SPECIES FOR WHICH ANGLIAN WATER LAND ASSETS HAVE THE POTENTIAL TO MAKE CONTRIBUTIONS TO AT A LANDSCAPE SCALE. THESE SPECIES MAY BE PROTECTED AT A EUROPEAN OR NATIONAL LEVEL OR HAVE BEEN IDENTIFIED AS OF CONSERVATION CONCERN. THE RELEVANT CONSERVATION LISTING OR LEGISLATION IS GIVEN.



SPECIES	NOTABLE BECAUSE	ASSOCIATED HABITATS OF PRINCIPAL IMPORTANCE IN ENGLAND
Osprey <i>Pandion haliaetus</i>	WCA Schedule 1, Birds of Conservation Concern 4 – Amber listed	Eutrophic standing waters
Nightingale <i>Luscinia megarhynchos</i>	Birds of Conservation Concern 4 – Red listed	Lowland mixed deciduous woodland and scrub
Barn owl <i>Tyto alba</i>	WCA Schedule 1, Birds of Conservation Concern 4 – Green listed	Arable field margins, lowland meadows
Peregrine falcon <i>Falco peregrinus</i>	WCA Schedule 1, Birds of Conservation Concern 4 – Green listed	
Farmland birds	NERC Act 2006 Section 41, Birds of Conservation Concern 3 – Red and Amber listed	Arable field margins, lowland meadows
Water vole <i>Arvicola amphibius</i>	WCA Schedule 5, NERC Act 2006 Section 41	Rivers
Otter <i>Lutra lutra</i>	Conservation of Habitats and Species Regulations 2010, WCA Schedule 5, NERC Act 2006 Section 41	Rivers
Bats <i>Chiroptera</i>	WCA Schedule 5, NERC Act 2006 Section 41	Arable field margins, hedgerows, woodlands, rivers, lowland meadows

SPECIES	NOTABLE BECAUSE	ASSOCIATED HABITATS OF PRINCIPAL IMPORTANCE IN ENGLAND
Pool frog <i>Pelophylax lessonae</i>	Conservation of Habitats and Species Regulations 2010, WCA Schedule 5, NERC Act 2006 Section 41	Lowland fens, ponds
White-clawed crayfish <i>Austropotamobius pallipes</i>	WCA Schedule 5, NERC Act 2006 Section 41	Rivers
Silver-studded blue <i>Plebejus argus</i>	WCA Schedule 5, NERC Act 2006 Section 41	Lowland heathland, coastal sand dunes
Pollinators	Including species of Principal Importance in England as outlined under the NERC Act 2006 Section 41	Arable field margins, lowland calcareous grassland, lowland meadows
Norfolk hawk <i>Aeshna isosceles</i>	WCA Schedule 5, NERC ACT 2006 Section 41	Lowland fens, ponds



FURTHER READING

UK National Ecosystem Assessment

<http://uknea.unep-wcmc.org/>

Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network

<http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>

The Natural Choice: Securing the value of nature. Natural Environment White Paper

<http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf>

EU Biodiversity Strategy

<http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm>

Biodiversity 2020: A strategy for England's wildlife and ecosystem services

<https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>



ANGLIAN WATER SSSIs



CONDITION OF ANGLIAN WATER SSSIs. AS OF MARCH 2016 98.9% OF ANGLIAN WATER'S SSSIs BY AREA WERE IN FAVOURABLE CONDITION.

SSSI	COUNTY	CONDITION MARCH 2016
Barrow Hill WR	Suffolk	Unfavourable recovering
Barton on Humber STW	Humberside	Unfavourable declining
Broadholme STW	Northamptonshire	Unfavourable recovering
Burnham Norton	Norfolk	Favourable
Bylaugh STW	Norfolk	Unfavourable no change
Caistor WS	Norfolk	Favourable
Chantry STW	Suffolk	Favourable
Codson Hill WR	Norfolk	Favourable
Colchester STW	Essex	Unfavourable recovering
Cranwich Wellington Plantation B BS	Norfolk	Unfavourable recovering
Dereham Rush Meadow STW	Norfolk	Unfavourable recovering
Didlington WS	Suffolk	Unfavourable recovering
Foxcote Reservoir	Buckinghamshire	Favourable
Grafham Reservoir	Cambridgeshire	Favourable
Grimsby - Pyewipe STW	Humberside	Unfavourable recovering
Havengore STW	Essex	Unfavourable recovering
High Ash - New WR	Norfolk	Unfavourable recovering
Maidscross Hill Reservoir	Suffolk	Favourable
Maldon STW	Essex	Favourable
Methwold Wellington Plantation A BS	Norfolk	Unfavourable recovering
Newbourne Springs	Suffolk	Favourable

SSSI	COUNTY	CONDITION MARCH 2016
Pitsford Reservoir	Northamptonshire	Favourable
Pitstone Reservoir	Buckinghamshire	Unfavourable recovering
Risby	Norfolk	Favourable
Rutland Reservoir	Rutland	Favourable
St. Osyth STW	Essex	Favourable
Stannett's Lagoon	Essex	Favourable
Surlingham Sub-Ferry Corner SP	Norfolk	Favourable
Surlingham, Coldham Hall Carnser	Norfolk	Favourable
Taverham Mills	Norfolk	Unfavourable no change
Tetney Blow Wells	Lincolnshire	Unfavourable recovering
Thorpeness STW	Suffolk	Unfavourable recovering
Tollesbury STW	Essex	Unfavourable recovering
Tuddenham Temple Bridge Rd	Norfolk	Favourable
Tuddenham WS	Suffolk	Favourable
Twelve Acre Wood - Borehole 3	Norfolk	Unfavourable recovering
Twelve Acre Wood - WS	Norfolk	Unfavourable recovering
Two Mile Bottom	Norfolk	Unfavourable recovering
Weeting STW	Norfolk	Favourable
Weeting Wellington Plantation C BS	Norfolk	Unfavourable recovering
Weeting Wellington Plantation C WA	Norfolk	Unfavourable recovering
Weeting Wellington Plantation D BS	Norfolk	Unfavourable recovering
Wellington Plantation Mis BH	Norfolk	Unfavourable recovering
Wicken-Wicken Lode	Cambridgeshire	Favourable
Wing WTW	Leicestershire	Favourable



PHOTO CREDITS



- 3 **Rutland Water Lagoons** - Anglian Water
- 4 **Castle Acre** - Mike Drew, Anglian Water
- 6 **Wood stacks** - Mike Drew, Anglian Water
- 7 **Killer shrimp** - Environment Agency
- Himalayan balsam** - GBNNSS
- 10 **Swallow** - Adrian Hinchliffe, Anglian Water
- Highland cattle** - Mike Drew, Anglian Water
- Pitsford Water drought** - Anglian Water
- 11 **Water vole** - Adrian Hinchliffe, Anglian Water
- 12 **Badger** - Adrian Hinchliffe, Anglian Water
- 14 **Comma butterfly** - Mike Drew, Anglian Water
- Banded demoiselle** - Mike Drew, Anglian Water
- 15 **Stakeholders Workshop** - Mike Drew, Anglian Water
- 16 **Osprey** - John Wright, Osprey Project
- Tetney Blow Wells** - Mike Drew, Anglian Water
- 17 **Hall Water Reservoir** - Anglian Water
- 21 **Biodiversity Champion, Steve Coles** - Anglian Water
- 22 **Wildflowers** - Mike Drew, Anglian Water
- 23 **Barn owl** - Steve Frost, Anglian Water
- Kestrel** - Adrian Hinchliffe, Anglian Water
- 24 **Hawthorn** - Mike Drew, Anglian Water
- Hedgerow** - Mike Drew, Anglian Water
- 25 **Aerial view of Donington on Bain** - Lincolnshire Chalk Streams Project
- White-clawed crayfish** - Mike Drew, Anglian Water
- 26 **Neutral grassland** - Mike Drew, Anglian Water
- 27 **Himalayan balsam** - Mike Drew, Anglian Water
- Nightingale** - Nick Clayton, Anglian Water
- Woodwalton Fen** - Chris Gerrard, Anglian Water
- 28 **Pool frog** - Mike Drew, Anglian Water
- 27 **Grey seals** - Kylie Jones, Anglian Water
- Oystercatchers** - Rob Dix, Anglian Water
- Common seal** - Adrian Hinchliffe, Anglian Water



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ANGLIAN WATER BIODIVERSITY STRATEGY



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Further information is available at
anglianwater.co.uk