

Broads Biodiversity and Water Strategy 2019-2024



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1 About the Broads

The Broads National Park is one of Europe's finest and most important wetlands for nature conservation. Its rich mosaic of habitats comprises, among other things, saltmarshes, intertidal mudflats, shallow lakes, fens, drained marshland, wet woodland, relict estuary and coastal dunes.

A quarter of the Broads Authority executive area is designated as Wetland Habitats of International Importance for its incredibly rich biodiversity. Farming and land management play a vital role in maintaining the Broads ecosystems and the services they provide, from food and reed thatch to biodiversity, local landscape character and employment. As we move forward, it is essential that future Environmental Land Management Schemes continue to support the Broads natural environment together with agriculture throughout the water catchment.

The Broads: Key facts and figures

The Broads is the UK's largest protected wetland and of international importance, with a mosaic of rare habitats of fens (75% of UK fen), wet woodland (almost entirely confined to East Anglia), 63 shallow broads and an estuary that supports the UK's highest winter bird numbers in its area.

The Broads Authority executive area is 303km². This core area for wildlife is supported by the wider Broadland rivers catchment of 320,200km², where land and water management support the downstream nature-rich sites of the Broads. The executive boundary is drawn tightly around the floodplains and lower reaches of the rivers Bure, Yare and Waveney, and their tributaries, the Thurne, Ant and Chet. The Broads area includes a small area of coast which could and has in the past had a profound impact on the Broads.

Approximately 95% of the executive area is at some risk of flooding, including over 2,000 properties and 30,000 hectares of land.

There are 28 nationally important Sites of Special Scientific Interest (SSSIs), and a quarter of the area is globally important for wildlife. These areas provide a habitat for a quarter of the UK's rarest plants and animals.

A biodiversity audit, based on 11 million records, shows that 26% of all UK Biodiversity Action Plan species are found in the Broads (Panter et al., 2011). Fen habitat in the Broads is a hotspot for 1,519 Species of Conservation Concern. There are no recent records for 423 (28%) of these, 67 of which are believed to be locally or nationally extinct (loc cit., Table 8). The Broads has been losing species at a rate of six per decade for half a century.

Of the 1,519 Species of Conservation Concern, there are 66 Broads Regional Specialties, including Milk-parsley and the Swallowtail, that are completely reliant on freshwater fen habitat for their survival (loc cit., pp. 33-34). Moreover, vegetation surveys indicate that only 20% of the fen area is suitable for Swallowtail, having both reed and Milk-parsley together (S24 NVC community).

Agriculture in the East of England is at the heart of an £8 billion food and farming industry, and farm businesses in the Broads make a significant contribution to this overall production. The tourism related value of angling in the Broads is estimated to be around the £100million per year.

2 About this strategy

The **Broads Biodiversity and Water Strategy** (BBWS) is produced by the **Broads Authority**, the body responsible for coordinating the management of the Broads. The Authority's three statutory purposes are to conserve and enhance the area's natural and cultural assets, to promote opportunities for people to understand and enjoy the special qualities of the area, and to protect the interests of navigation.

The BBWS does not encompass everything that is happening to manage the habitats, water and wildlife of the Broads. Rather, it focuses on priority actions by the Broads Authority as a lead or joint delivery partner, and key projects led by other organisations working in the Broads.

The BBWS is monitored by the **Broads Biodiversity Partnership** (BBP). The BBP is a network of organisations, businesses and individuals working together to discuss, coordinate and deliver work for habitat enhancement, creation and restoration in and around the Broads, with a focus on actions that create multiple benefits for biodiversity, water and people. We also work with a wider group of stakeholders including local communities, farmers and land managers, and interest and amenity groups.

Developing the BBWS together helps to clarify roles and streamline processes, encouraging effective partnership working. The strategy provides the framework and action plan to help us understand, record, protect and enhance biodiversity and water in the Broads over the next five years (2019-24).

The strategy was adopted by the Broads Authority on 26 July 2019 and replaces the BBWS 2013-18.

Broads Biodiversity Partnership members

Anglian Water, British Dragonfly Society, Broads Authority, Broads IDB, Butterfly Conservation, Environment Agency, Essex & Suffolk Water, Freshwater Habitats Trust, Little Ouse Headwaters Project, Hymettus, Natural England, National Trust, Non-Native Species Initiative, Norfolk Biodiversity Information Service, Norfolk County Council, Norfolk Flora Group, Norfolk Wildlife Trust, Norfolk and Norwich Naturalists' Society, Plantlife, RSPB, Suffolk County Council, Suffolk Wildlife Trust, University of East Anglia, Water Management Alliance

3 Our aspirations

The BBWS is linked to the higher-level **Broads Plan**, the partnership strategy for the Broads. While the Broads Authority is responsible for producing the Broads Plan, its implementation relies on integrated partnership working with a wide range of organisations and individuals including farmers, water users, land managers, businesses, statutory agencies, water companies, charities and social enterprises.

The aspirations in the [Broads Plan \(2017\)](#) for managing biodiversity and water are:

Aspiration 1: Improve water capture and efficient water use across the Broadland Rivers Catchment, and develop a longer-term integrated flood risk management strategy for the Broads and interrelated coastal frontage.

Aspiration 2: Protect, conserve and enhance water quality and land and habitat condition to benefit priority species, recognising natural environmental change and retaining a thriving and sustainable agricultural industry.

Achieving these aims is linked to other aspirations in the Plan, including Aspiration 9 (Strengthening connections with people) and Aspiration 10 (Building ‘climate-smart’ communities). While these themes are dealt with in other guiding strategies, the BBWS recognises the importance of involving people in managing biodiversity and water.

To meet our aspirations, we want to see a long-term future where:

- Nature in the Broads National Park is thriving and contributing to a larger network of wildlife-rich places (in line with Government policy) to restore nature and in keeping with the status of the Broads as a globally important wetland.
- Wildlife-rich places are becoming larger and buffered from intensive agriculture. Land management options for farmers are creating more species-rich habitats and bespoke solutions for wildlife to ‘spill over’ into the wider countryside beyond the Broads.
- Wetlands are functioning more naturally, and the catchment is supporting water dependent wildlife that has space and ability to move and adapt to climate change and sea level rise.
- Abundant wildlife is moving from place to place and rare species have their environmental needs met and a secure future across the landscape.
- Research and monitoring in the Broads is providing the evidence base to enhance nature and direct conservation management.
- Agricultural and water management businesses are working together to produce a range of benefits including biodiversity, food and biomass, high-quality water supply,

carbon storage, pollination, disease and pest regulation, landscape character and sustainable recreation. Projects are achieving multiple benefits that result in biodiversity gain, water improvements and profitable business.

- Invasive alien species are being actively managed, with damage to habitats and native species being controlled.
- Development is appropriately located to avoid adverse effects on protected areas and wildlife, and actively delivering net gains for wildlife. People who manage land have enough resources to deliver the biodiversity gains needed.
- Communities better understand and are involved in making decisions in their own areas to support their local nature projects, with more volunteers supported to carry out management and monitoring.
- Sustainable tourism is in place and water users are choosing sustainable activities to enjoy the rivers and broads ('Saving nature through people'). People recognise and understand the value of biodiverse habitats and there is appropriate sustainable development and recreation.

4 Where we are now

Since we adopted the last BBWS in 2013, there have been important changes in policy and guidance, and in environmental and social contexts at both local and national levels. We have analysed emerging trends and new opportunities to set the context for the updated BBWS.

Conservation partners and landowners are continuing to carry out targeted land, habitat and water management in priority habitats and areas shown on the maps in Annex 4. These actions are also achieving benefits for the Broad ecosystem and the goods and services, such as clean water, food and pollination that a healthily functioning ecosystem provides for wildlife and people.

A list of key achievements in delivering the BBWS 2013-18 is in Annex 3.

National policy and guidance

Context

- The [25 Year Environment Plan](#) (25YEP, 2018) sets out Government action to help the natural world regain and retain good health.
- The Agricultural Bill (2018) sets out how farmers and land managers will in future be paid for 'public goods', and consultation on the design of the Environment Land Management Scheme has started.

- Government's development of 'Net Gain' principles is testing ways to encourage or require development to leave biodiversity in a better state than before to reverse the decline in UK habitats and species.
- The Judicial Review of Water Framework Directive implementation is evaluating mandatory use of Water Protection Zones.
- Defra has made changes to abstraction and water management to improve the management of water in the environment and our resilience to flooding and droughts.

Emerging trends and evidence

- There is continued emphasis on landscape-scale management encouraging groups of people to work together, including the facilitation fund, farm clusters and catchment-based approach.
- The narrative for conserving freshwater and wetland habitats in England (Natural England report NERR064) is being incorporated into the future determination of [Important Freshwater Areas](#) and the Nature Recovery Network.

New opportunities and evidence

- The UK's exit from the EU is not yet defined but may provide an opportunity to shape a new approach to sustainable land management, enabling all farmers within and alongside our National Parks to be proactive environmental managers whilst helping our rural economies to become more sustainable and supporting the vibrancy of our communities. The [National Parks England Future of Farming](#) sets out initial ideas.
- Funding is allocated to plant woodland to create multiple benefits including water quality and natural flood management in upper river catchment areas, and to plant key buffer zones in appropriate landscapes around the Broads.
- Health professionals are prescribing nature-based treatments for improving people's health. National Research Councils emphasise the need to apply learning to help practitioner organisations, such as the Demonstration Test Catchment on the River Wensum.
- The review of the current agri-environment scheme provides landowners and conservation organisations with the opportunity to help define how a scheme may look, be applied and agreements assessed to provide benefit for conservation and the Broads landscape.

National environmental and social change

Context

- In the National Parks National Awareness survey (2018) the public ranked nature, species and habitats as the most important responsibility for the Parks. However, the Parks are designated for their natural beauty, not for their species abundance. The independent review, led by writer Julian Glover, will explore how AONBs and

National Parks meet our needs in the 21st century. This provides an opportunity to clarify the role of the Parks in species and habitat enhancement.

- An improved regional framework for effective management of Invasive Alien Species is developing under the RAPID LIFE project.ⁱ

Emerging trends and evidence

- There is reduced government investment in biodiversity and funding cuts to National conservation bodies; for example, Natural England's budget has been cut by over 44% in the last 11-year period.
- Of the 218 countries assessed for 'biodiversity intactness'¹, the UK is ranked 189 as a consequence of centuries of industrialisation, urbanisation and overexploitation of natural resources.ⁱⁱ
- In 2016 over half (56%) of UK species are assessed to have declined since 1970.ⁱⁱ
- There is a general shift of conservation approaches to include:
 - larger linked high nature value sites
 - moving from thinking about solely 'vegetation type' to also considering 'ecosystems'
 - accepting dynamism, accommodating change and increasing species diversity across the food web (herbivores and carnivores) and across functional groups (such as ecosystem engineering via graziers (such as the beaver)
 - restoring and working with natural processes
- The Met Office (2017)ⁱⁱⁱ reports of change between two periods 1961-90 and 2008-17 show that the average hottest day has increased by 0.8°C, and warm spells have more than doubled in length from 5.3 to 13.2 days (4.2 to 13.2 days in East Anglia). Rainfall has not significantly increased in this period for East Anglia.
- IPCC Assessments of climate change (2018)^{iv} show global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.
- East Anglia is sinking at 0.5mm yr⁻¹ (Bradley et al. 2009) combined with a possible sea level rise of 260 to 980 mm by 2100, although any positive climate feedback makes it difficult to fully understand a level rise and make regional estimates.
- The UK is forecast to become a refuge for plants, butterflies and birds as continental Europe warms up. However, intensive agricultural land-use is likely to restrict the

¹ <https://www.bipindicators.net/indicators/biodiversity-intactness-index>

ability for species to seek refuge in East Anglia. Climate warming increases the risk of new pests and diseases.

- There is a trend to enabling individuals to deliver lasting conservation beyond nature reserves, including farmer-led approaches.

New opportunities and evidence

- The arrival and translocation of new wetland species, such as great white egret, spoonbill and fen raft spider are creating various opportunities, such as greater engagement with people interested in wildlife and associated wildlife tourism.

Local policy and guidance

Context

- The Broads Local Plan was adopted in May 2019 with updated and new policies to benefit the environment, including the treatment of peat within development decisions.
- Visitor disturbance studies are informing the Recreational Avoidance and Mitigation Strategy and leading to payments from housing development.
- Assessment of the last 30 years of monitoring data (Lake Review, 2015) creates a stronger evidence for lake ecology, informing lake and river water quality restoration.
- Economic value of the Broadland fishery is recognised and management decisions are taken with a Net Gain approach recognising this value^{vi}.
- Water abstraction assessments for some of the Ant Valley Fens create a bigger evidence base supporting sustainable water use within the catchment without impacting on fen ecology.
- The Softrack fen harvester makes fen conservation management more resource efficient, with overall less machinery breakdowns.

New opportunities and evidence

- New mapping tools inform opportunity areas for nature. These include Catchment Ecosystem Services, Norfolk Ecological Networks, Green Infrastructure and developing bat sensitivity to development^{vii} and National B-Lines².
- The Broadland Futures Initiative will work with local people to develop a framework for integrated flood risk management for the coast and Broads.

² B-Lines are a series of the best placed 'insect pathways' running through the countryside and towns, along which creation and restoration of wildflower-rich habitat could be prioritised to benefit bees, butterflies and a host of other wildlife.

- A collaborative approach to the provision of advice and delivery of works linked to agri-environment agreements presents a unified, non-competitive, coordinated approach and engenders client trust in the services being offered.

Local environmental and social change

Context

- The consideration of river ecosystems in the Lake Review (2015), fish tracking under HLF and EU LIFE (2018) and the use of PCLake model (2018) with experts from the Netherlands, under the CANAPE EU Interreg project, has informed lake restoration at Hoveton, Hickling and Barton Broads. This evidence also supports the cautionary use of sediment removal for broads' ecological improvement, due to continued release of nutrient following sediment removal.
- Small-scale lake restoration, such as biomanipulation at Barton and rebuilding reed margin at Salhouse, has led to large-scale lake restoration at Hoveton and Hickling Broads and planning restoration at Ranworth Broad.
- Some species conservation and translocation projects have been successful, including the Fen Raft Spider, Fen Orchid and Flat-leaved Pondweed projects.
- The possible County Wildlife Sites in the Broads have been assessed, landowners contacted and sites designated.
- The Wild Watch camera project has engaged hundreds of people in spotting wildlife in their gardens and the Broads area.
- The Broadland Catchment Partnership and ecosystem services opportunity maps have increased engagement with farmers and their advisors. The maps show high run-off risk areas and several demonstration projects to improve rural drainage have been located using this information.
- The Broads Authority and Tesco project resulted in one of the first supermarkets supporting catchment work. This supported the purchase of soil management equipment to prevent field runoff.
- Efforts have begun to better coordinate fen research and monitoring, but much more is needed to understand water levels, flow and quality in fen habitat.

Emerging trends and evidence

- Areas of grazing marsh have been converted to arable.
- Water resources are scarce and insufficient to meet increasing demands from a rising population and water companies' statutory duty to provide water.

- 86% of SSSIs are in favourable or recovering condition, and almost 60% in favourable condition in 2019.
- Climate warming is contributing to changing growth in algae and water plants.
- Water quality has remained fairly stable over the last five years, with little change in most rivers. Nitrogen and pesticide remain an issue in larger river catchments such as the Waveney.
- Constructed wetlands and use of cover crops are benefiting water quality and natural flood management in catchments.
- Special Area of Conservation (SAC) lakes connected to the rivers have too high phosphorus levels to prompt recovery in the broads in the Bure and Ant valleys without further measures.
- Water plant growth is increasing in many upstream rivers and some broads, with benefits for fish, local biodiversity and water quality. Increasing water plant cutting is required to provide access for boats.
- The sustainable, healthy and balanced fish community are improving, which is thought to be beneficial for wider wildlife. Fish biodiversity and productivity is important for the Broad. Tourism as a result of angling is thought to be worth £100million to the local economy. Fish deaths in the Thurne have been caused by toxins produced by prymnesium algae in some years.
- Efforts have begun to better coordinate fen research and monitoring, but much more is needed to understand water levels, flow and quality. Records of site management and actions for species translocation have improved (Fen Research Workshop, 2017).
- Invasive non-native species, such as mink and Floating Pennywort and a variety of other species require continual biosecurity measures and management to control the spread where possible.
- More people are taking part in marshalled swimming events swimming in the Broad waterways, possibly due to the improved water quality and increasing popularity of this activity.
- Tidy management could be restricting opportunities for biodiversity particularly in garden and public spaces.

New opportunities and evidence

- More collaborative research and monitoring are required to help understand fen hydro-ecology, particularly in the context of declining resource for monitoring from the EA and NE.

- Knowledge generated by research that benefits and influences the environment is increasingly important. This could result in greater collaborative research with academic originations and research funding being made more applicable for conservation organisations.

5 Drivers for change

Looking ahead, we face changes likely to have a significant and increasing impact on the natural, environment of the Broads and surrounding area, with potential impacts for social and economic factors. Table 1 highlights the key drivers for change with linked pressures, risk and opportunities, linked with the projected pressures, risk and opportunity they bring.

Table 1

Key drivers for changes

| Drivers | Projected pressures | Risk and opportunity |
|----------------|--|--|
| Climate change | Greater likelihood of flooding due to increasing occurrence and severity of weather events | <p>Risk: More winter rainfall and higher winter river flows and floodplain wetland water levels. Surge tides and salinization of floodplain wetlands and loss of freshwater dependant species, such as Fen Orchid, Norfolk Hawker dragonfly and Swallowtail butterfly and numerous other species of conservation concern.</p> <p>Opportunity: Higher levels of awareness among general public.</p> |
| Sea level rise | Higher water levels Increase in incidence and impact of seasonal storms | <p>Risk: Surge tides and salinization of floodplain wetlands and loss of freshwater dependant species, such as Norfolk Hawker dragonfly, Swallowtail butterfly, Fen Orchid, fish and numerous other species of conservation concern. Coastal change could be significant for northern Broads.</p> |
| Climate change | Hotter drier summers, more frost-free days | <p>Risk: Wetland habitats (e.g. dykes, and fens) drying out resulting in species losses dependant on the severity of the drought. Stagnation and dissolved oxygen crashes with reduced freshwater flow and summer storms. Increased risk of fires and damage to habitat and peatland resource and spread of new pests and diseases.</p> <p>Opportunity: Colonisation by species such as willow emerald damselfly and egrets.</p> |

| Drivers | Projected pressures | Risk and opportunity |
|---|---|--|
| Water abstraction | Lower than natural river and groundwater flows | Risk: Poorer river and broad water quality, making wetland habitats more sensitive to pollution and having potential negative impacts on groundwater dependant fen vegetation communities. |
| Waste water and diffuse water pollution | Negative effects on water quality of floodplain habitats and waterbodies and their ecosystems | Risk: Nutrient enrichment deteriorates natural ecosystems, which results in less rare species and takes decades to restore with some changes being permanent. |
| Land management | Both positive and negative influences, depending on management practices, e.g. lack of scrub removal results in woodland development and loss of rare fen communities | Risk: Numerous and can generally be managed via good practice. Some losses can be permanent, such as land subsidence as a result of water drainage. Opportunity: Significant chance to benefit nature through good land management practice. |
| Alien invasive species | Negative effects on the conservation funding, land and water management, habitats and species | Risk: Dependent on alien invasive species and include predation (e.g. American Mink), competition (New Zealand Pygmyweed), flooding and navigation risks from choking rivers (e.g. Floating Pennywort) |
| Development | Habitat loss, modifications, isolation and fragmentation | Risk: The majority of small developments in the Broads result in minor negative impacts that can add up to be more significant, although this is often dependant on the management of the scheme over the long-term. Opportunity: Some development has the potential to enhance wildlife, particularly in rural areas, including flood alleviation schemes and making homes for bats and owls in mills and barns. Mitigation funds can enable improvements to habitats. |
| Visitor numbers | Potential for disturbance to species and habitats | Risk: Direct disturbance to wildlife and habitats, such as breeding birds and trampling of sand dunes. Opportunity: Improved engagement with people about nature. |

| Drivers | Projected pressures | Risk and opportunity |
|--|--|---|
| Brexit | Potential impact on a wide range of issues including environmental legislation and European funding | <p><i>At the time of writing there is no certainty about what changes may happen following our departure from the EU</i></p> <p>Risk: Delay in producing a robust legal framework for environmental issues. Reduced opportunities for external funding from the EU.</p> <p>Opportunity: Leaving the EU and the Common Agricultural Policy provides an opportunity for reform to rural payments for example towards an ecosystem approach that rewards provision of public goods, such as flood prevention and carbon storage.</p> |
| Local economy | Developing wildlife and nature-based tourism economy, larger visitor numbers | <p>Risk: Lack of affordable housing can result in conservation contractors and reed cutters not being able to live locally.</p> <p>Opportunity: Positive engagement through wildlife based holidays and guides. More money into the local economy.</p> |
| Urbanisation and disconnect with nature | Low awareness, engagement and support for nature conservation | <p>Risk: People disconnected and unfamiliar with the natural environment.</p> <p>Opportunity: Positive engagement is able to increase awareness.</p> |
| Knowledge and dedicated funding resource | <p>Lower numbers of experienced ecologists and conservation officers</p> <p>Less funding for wildlife conservation</p> | <p>Risk: Cuts in government funding, previous European grants no longer available and drop in membership of charities may result in lower resources for conservation, leading to poorer understanding and less wildlife.</p> <p>Opportunity: Funding agreed for future activities planned with Water Mills and Marshes Landscape Partnership Project, along with CANAPE and ENDURE EU Interreg projects.</p> |

6 Monitoring

The Broads Biodiversity and Water Strategy's Action Plan will be reviewed annually by the Broads Biodiversity Partnership. This will use a 'traffic light' system for rating the progress of actions and completing status reports. This system will indicate if a project is on track, slower than expected or at risk of not being completed. Project status and reasons for any non-achievement will be reported to the Broads Biodiversity Partnership annually and Broads Authority committee as required.

Over the five years to 2024, new priority projects that meet the objectives of the BBWS are likely to be created. As this happens, the Authority and partners will update the BBWS action plan. It is likely that most of the additions and amendments will be within the 2021 to 2024 time period.

7 BBWS Action Plan 2019-24

We will implement the BBWS Action Plan alongside other relevant guiding strategies including the Broadland Rivers Catchment Plan, the emerging Rivers and Broads Strategy (containing management information on sediment, water plant, tree, river-bank and invasive species), the Authority's strategies for education, volunteering and integrated access in the Broads, and many site-based plans. Land use policy will be informed by the Broads Local Plan.

The BBWS is also informed by a number of national strategic groups, such as the Terrestrial Biodiversity Group, Major Landowners Group, External Working Group for Rural Development Programme for England, and Lowland Peat Agricultural Task Force. The National Park Authorities and the Broads Authority are represented on all these bodies.

At the time of writing, the Brexit situation is unresolved, but it is assumed that the transition period will run until 2023. Given this, and the proposed changes to the environmental land management scheme post-Brexit, this Action Plan will be reviewed in 2022 and updated as necessary.

Through the delivery of the BBWS there will be emerging government work to improve the planning system to leave the natural environment in a measurably better state than before (biodiversity Net Gain). Initiatives under the Nature Recovery Network will work towards bringing back wildlife and Local Natural Capital Plans will be piloted and applied to support multiple benefit local decision making.

The actions are written primarily for a technical and specialist audience.

Broads Biodiversity and Water Strategy: Action Plan 2019-2024

The Action Plan focuses on priorities for the Broads Authority as a lead or joint delivery partner, and on key projects led by other organisations working in the Broads. Several actions would not be possible without the support of volunteers, who make a huge positive contribution to our biodiversity work.

Table 1

Carry out lake restoration, maintenance and enhancement work, including bio-manipulation; use monitoring evidence to trial and implement further innovative lake (broad) and river restoration techniques

| Ref | Detailed actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|--|------------------|-------------|-------------|--|----------|
| 1.1 | Facilitate use of PCLake model to assess thresholds for ecological change in lakes relating to phosphorus and other management, as part of coordinating a strategic approach to lake restoration | BA (WEG & BIFFA) | NWT, EA BBP | 2019/20 | Managers of lakes are using the tool to make more informed decisions on the most important factors relating to lake restoration | |
| 1.2 | Complete Hickling Broad Enhancement Project as part of CANAPE Interreg Project, in line with project plan | BA (CANAPE) | NWT | 2018 - 2021 | Larger areas of reed swamp are providing better habitat for wildlife such as bittern and protecting an area of shallows so water plants can grow in sheltered conditions created | |

| | | | | | | |
|-----|--|-------------------|---------|-------------|---|--|
| 1.3 | Implement biomanipulation work at Barton Broad and Ranworth Broad in line with project plan | NWT (BIFFA) | BA, EA | 2019/20 | Restoration work is increasing the diversity of water plants, improving the aquatic environment for species and enhancing wildlife viewing opportunities for visitors | |
| 1.4 | Complete Hoveton Great Broad LIFE and HLF Project in line with project plan | NE (LIFE and HLF) | BBP | 2018 - 2021 | Larger areas of reed swamp and clearer water are providing better habitat for wildlife and increasing public understanding | |
| 1.5 | Implement erosion prevention and river bank works and provide protective conditions on development to safeguard fish habitats in line with work plan | BA | EA | Ongoing | Resilient river habitat is supporting a sustainable, balanced and healthy fishery | |
| 1.6 | Carry out fish management and fishery enhancement at Ormesby Broad and repair fish barriers in line with management plan | ESW (NWT) | TBP | Ongoing | Clear water is enhancing water plant and water bird populations | |
| 1.7 | Implement measures to maintain clear water at Whitlingham LNR, including bird feeding management, sensitive water plant management and assessing impact of potential fish introduction | WCT | NCC, BA | tbc | The many environmental benefits of clear water for people, habitats and wildlife are ongoing | |

| | | | | | | |
|-----|---|------------|-------------|-----|---|--|
| 1.8 | Investigate options for and replace water management assets such as pumps in Upper Thurne | Broads IDB | BBP | tbc | The many environmental benefits of clear water for people, habitats and wildlife are ongoing | |
| 1.9 | Implement Environment Section of River Wensum Strategy | Norwich CC | BA, NCC, EA | tbc | The River Wensum urban corridor is supporting more wildlife and improving people's enjoyment of this area | |

Table 2

Promote and implement measures to reduce point and diffuse pollution into the floodplain and water courses, commensurate with EU/national water and habitat targets and with sustainable farming

| Ref | Detailed actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|---|------|----------|-----------|---|----------|
| 2.1 | Develop Rivers and Broads Strategy (tbc) | BA | BBP | 2019/20 | Wildlife (particularly fish) breeding, wintering and feeding areas are improving to ensure maximum benefit is gained from every pound spent | |
| 2.2 | Respond to policy consultations to help justify water quality and protection of water resources (e.g. Water Framework Directive, Water Cycle Studies, Water Abstractions) | BA | n/a | Ongoing | Policy makers are understanding more clearly the impact of their policy decisions on the Broads ecosystems and are making | |

| | | | | | | |
|-----|--|--------|----------------------|-------------|--|--|
| | | | | | policy changes to help improve management | |
| 2.3 | Implement Diffuse Water Pollution Plans following completion | EA, NE | BCP | 2019 - 2020 | The Plans are supporting improved water quality and more wildlife, in turn improving peoples' enjoyment of these areas | |
| 2.4 | Support development of local guidance for Environmental Land Management Schemes (ELMS) for resource protection to inform plans (links to action 3.4) | NE | BCP, BBP, landowners | 2019-2022 | Farmers are using locally agreed information to achieve better environmental benefits | |
| 2.5 | Implement Water Sensitive Farming land management engagement and advice | NRT | BCP | 2019-2020 | Effective farmer engagement is supporting uptake of innovative measures to protect and enhance water and wildlife | |
| 2.6 | Carry out six litter picks annually to reduce pollution in Broads waterways and support other litter picking initiatives | BA | n/a | Ongoing | Less litter in Broads' waterways is reducing harmful impacts on aquatic and marine food chains | |

Focus: Managing existing fen, reed bed, wet grassland and wet woodland

Table 3

Maintain and enhance existing areas of priority fen, reed bed, grazing marsh and wet woodland through site management agreements/ prescriptions and support services to site managers

| Ref | Detailed Actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|--|----------|-------------------------------------|-----------|--|----------|
| 3.1 | Respond to policy consultations to help secure support for wetland management and species conservation (e.g. Net Gain, Environment Strategy, Peatland Strategy and input into Lowland Peatland Agriculture Task Force) | BA | BBP partners also likely to respond | Ongoing | Policy makers are understanding more clearly the impact of their policy decisions on the Broads ecosystems and are making policy changes to help improve management | |
| 3.2 | Carry out innovative water seepage work at How Hill NNR through management of surface water and catch dykes and creation of greater areas of open water as part of Water Environment Grant | BA (WEG) | RSPB, NWT | 2019-2021 | Wildlife is being protected and obligations to meet designated site conditions are being met while adapting to a changing climate Natural water seepage is supplying fens and creating conditions for lost fen vegetation communities to re-establish | |
| 3.3 | Develop collaborative programme of fen management measures additional to those required for agri-environmental schemes (e.g. enhancing natural water seepage and flows, turf ponding, scrapes | BBP | - | 2021 | Farmers and land managers are collaborating to achieve appropriate management to support achievement of biodiversity and wider environmental benefits | |

| | | | | | | |
|-----|---|---------------------------------------|--|------------------|---|--|
| | and foot drains) and seek funding to support farmers and land managers to implement measures | | | | | |
| 3.4 | Support development of local guidance for Environmental Land Management Schemes (ELMS) for fen, marsh and woodland to inform plans | NE | BBP, BCP, land-owners | 2022 | Farmers and land managers are using locally agreed information to achieve better environmental benefits | |
| 3.5 | Develop proposal for Defra on elements of ELMS to test and trial, including scheme design, role of coordinated advice and farm clusters | BA | BBP, BCP, Farmers and land managers, Defra | 2019-2020 | Ideas and discussions from the Broads are informing the development of the future ELMS | |
| 3.6 | Provide advice on wetland management to landowners and organisations on request and during fen management demonstration in Autumn 2019 | Broads Land Management Service (BLMS) | BBP, BRASCA and advisors | Ongoing and 2019 | Farmers and land managers are being supported by expert knowledge and appropriate management is being undertaken, working with sustainable businesses and under clear agreements, to create biodiversity and wider environmental benefits | |
| 3.7 | Provide advice to land managers to deliver maximum benefits for breeding waders, wintering waterfowl and other priority | BLMS | BBP and advisors | 2019-2020 | BLMS trial is providing effective ways of farmer engagement and uptake of schemes to result in | |

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|------|---|-------------------|----------------------|-----------|--|--|
| | species through effective use of environmental stewardship | | | | public benefits e.g. wildlife, carbon in soils | |
| 3.8 | Revise and implement management plans for How Hill NNR and Buttle Marsh, including detailed consideration of hydrological function | BA | NE | 2021 | Wildlife is being protected and landowners' obligations to meet designated site conditions are being met while adapting to a changing climate | |
| 3.9 | Manage BA contracted wetland sites in accordance with annual and longer-term management agreements and plans | BA | landowners | Ongoing | Wildlife is being protected and landowners' obligations to meet designated site conditions are being met | |
| 3.10 | Carry out joint review of key management plans such as Breydon, Barton, Hickling and mid-Yare | BBP | - | Ongoing | Partners are working together to protect wildlife and landowners' obligations and designated site conditions are being met | |
| 3.11 | Test conversion of cut material from wetland agriculture (paludiculture) into products such as biochar and soil improvers, and evaluate product viability and markets as part of CANAPE and Broads Landscape Partnership Scheme: Wild Compost | BA (CANAPE , WMM) | Business, landowners | 2019-2022 | Business and farmers are more aware of opportunities for new product creation and supply logistics from wetlands. Products are being market tested to develop greater understanding of paludiculture supply chains | |

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|------|--|--------------|-----------------------|-----------|--|--|
| 3.12 | Map paludiculture potential, including reed and sedge harvest, as alternative agricultural system for reducing carbon emissions as part of CANAPE | BA (CANAPE) | Business, landowners | 2019-2022 | Business and farmers are more aware of opportunities for income generation and markets for products from wetlands | |
| 3.13 | Implement peat citizen science and peat engagement project as part of CANAPE Interreg project and linkup with citizen science project in ENDURE Interreg project on sand dunes | BA (CANAPE) | BBP | 2019-2021 | The gained knowledge and skills of 6 th form students are engaging their peers and the community about biodiversity and geodiversity in the Broads People's learning about different citizen science projects is improving future projects | |
| 3.14 | Implement Broads Landscape Partnership Scheme Programme 5: Natural Landscapes Wild Watch and aquatic invertebrate identification training | BA (WMM) | Broads LPS Board, BBP | 2019-2021 | People are becoming more engaged with biodiversity in the Broads and their knowledge and skills are improving | |

Table 4

Define, implement and monitor management regimes for priority species

| Ref | Detailed Actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|---|------|--------------------------------------|-----------|--|----------|
| 4.1 | Monitor approved programme for water plants, fen plant transects and water levels at selected sites and Crested Buckler Fern, Swallowtail larvae, butterfly transect, breeding Bittern at How Hill and Buttle Marsh | BA | BBP at non-BA owned or managed sites | Annually | Trends in species populations are being understood in accordance with environment change and management | |
| 4.2 | Facilitate data input to maintain overview of trends and identify action required where issues are identified | BBP | - | Ongoing | Trends in species populations are being understood in accordance with environment change and management | |
| 4.3 | Review EA monitoring network, linkages to BA monitoring network according to funding constraints, management and knowledge priorities | EA | BA | 2019/20 | Partners are agreeing priorities for the monitoring framework | |
| 4.4 | Define environmental triggers to support further lake restoration decisions on Trinity Broads | TBP | - | 2019/20 | Lake restoration in the Trinity Broads is achieving better results, having been informed by more robust evidence | |

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|-----|---|--|---------------|---|---|--|
| 4.5 | <p>Assess findings of surveys and species recovery programmes for Little Whirlpool Ramshorn snail, to inform guidance to farmers, land managers and advisors. Work includes:</p> <ul style="list-style-type: none"> a. Translocate to four sites, monitor monthly b. Monitor ditch translocation for five years c. Monitor to ensure no population effects during wetland creation scheme d. Monitor monthly at three sites for four years, intensive studies on 6 sites, discussing management with landowners e. Steering meetings | <p>BBP, Abrehart Ecology</p> <ul style="list-style-type: none"> a. High ways Engla nd b. WMA c. SWT d. Abreh art Ecolo gy e. AECO M | BA | <p>Ongoing</p> <ul style="list-style-type: none"> a. 2023 b. 2023 c. 2022 d. 2020 e. Ongo in g | Target species are making use of more opportunities to expand in the Broads | |
| 4.6 | <p>Review data for species recovery programmes for fen raft spider, including next steps, and submit report for national publications such as British Wildlife and Arachnology</p> | Helen Smith (consulta nt ecologist) | BA, RSPB, SWT | 2019/20 | Target species are making use of more opportunities to expand in the Broads | |
| 4.7 | <p>Assess findings of species recovery programmes for Fen Orchid to inform action plan</p> | Plant life | BBP | Ongoing | Target species are making use of more opportunities to expand in the Broads | |

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|------|---|-------------------|----------------|-----------|--|--|
| 4.8 | Collect seed from Greater Water Parsnip for species recovery work with schools under Broads Landscape Partnership Scheme Programme | BA | LPS Board, BBP | 2019-2020 | Target species are making use of more opportunities to expand in the Broads | |
| 4.9 | Monitor Whitlingham swift tower for nesting success, communicate findings to visitors of site and promote information leaflet on encouraging swift nesting | BA | WCT | annually | Target species are making use of more opportunities to expand in the Broads | |
| 4.10 | Through Norfolk Local Bat Conservation Plan, make proposals to regulate and manage countryside to deliver greater benefits to bats from planning system and other relevant mechanisms | NE | BTO, BBP | | Information on the distribution of bats is helping to protect and enhance the most important local locations for bats | |
| 4.11 | Monitor <i>nathusius pipistrelle</i> bats around Broads and coast to improve understanding of species migration from Europe and breeding sites around Broads | Norwich Bat Group | BA, ESW | Annually | <i>Nathusius pipistrelle</i> breeding sites are being protected and migration routes are understood to support measures to conserve this species | |

Table 5

Define, implement and monitor management regimes for invasive non-native species (INNS)

| Ref | Detailed Actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|---|-------|--------------------------------------|-----------|--|----------|
| 5.1 | Monitor invasive non-native species (INNS) as part of annual water plant survey | BA | - | Annually | Trends in invasive non-native species are being better understood in relation to environmental change and management action is better informed | |
| 5.2 | Undertake direct control of priority INNS on BA land and close to areas with high risk of spread on priority basis | BA | BBP at non-BA owned or managed sites | Annually | Priority INNS are being eradicated or controlled to manageable background level to protect biodiversity, water flow and navigation | |
| 5.3 | Carry out control programmes for American mink, Floating Pennywort and other priority invasive non-native species | NNNSI | - | Annually | Priority INNS are being eradicated or controlled to manageable background level to protect biodiversity, water flow and navigation | |
| 5.4 | Carry out 'Check Clean Dry' and 'Be Plant Wise' awareness campaigns in Broadcaster, Broadsheet and key waterway access points | BA | Parish Councils | Annually | The public are helping to prevent the spread of INNS and playing their part in protecting their local biodiversity, water flow and navigation | |

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| 5.5 | Communicate success of biological control for Himalayan Balsam around River Bure and if successful roll out to other areas | NNNSI | - | 2019 | Himalayan Balsam stands are reducing their vigour and spread | |
|-----|--|-------|---|------|--|--|

Focus: Extending and creating new areas of high biodiversity value habitat, habitat networks and buffer zones within the Broads catchment

Table 6

Create 'bigger, better and more joined up' areas of priority habitat by identifying opportunities and developing site specific plans for new habitat areas, connections, buffer zones and pollinator networks

| Ref | Detailed Actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|---|-----------|------------|-----------|--|----------|
| 6.1 | Develop vision for Hickling and other Broads Living Landscapes projects, including reed swamp protection and creation by using dredged sediment | NWT | BA, NE, EA | Ongoing | Landowners and local people are being motivated around a single vision to do more for biodiversity and sustainable management | |
| 6.2 | Deliver Suffolk Broads project creating larger areas of wetland, including habitat creation by using dredged sediment | SWT (HLF) | BA | Ongoing | Wetland species have larger areas managed for their needs and are able to move through a landscape, becoming more resilient to change including climate change | |

| | | | | | | |
|-----|---|------------------------------|---------------------------|------------|--|--|
| 6.3 | Deliver Bure and Thurne Broads Project creating larger areas of wetland | NWT | BBP | Ongoing | Wetland species have larger areas managed for their needs and are able to move through a landscape, becoming more resilient to change including climate change | |
| 6.4 | Implement Natural Flood Management and River Restoration Projects, such as Upper Bure, Badley Moor on River Tud and Sculthorpe Moor, including fish habitat improvement plans | Various partners within BCP | - | Ongoing | River species are having better places to live, breed and eat, and the water flow regimes to allow them to survive | |
| 6.5 | Implement programme of Catchment Sensitive Farming advice | NE, EA, Water Companies, NRT | BCP | Ongoing | Landowners are being supported by expert knowledge and the appropriate management is being undertaken, under clear agreements, to support achievement of wider environmental benefits and biodiversity | |
| 6.6 | Deliver Broads Priority Landscape project, including development of Broads Land Management Services helping landowners create larger | RSPB (WMM) | BBP, local FWAG, Claritie | 2018- 2022 | Wetland species have larger areas managed for their needs and are able to move through a landscape, becoming more | |

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|------|---|--|--|------------|---|--|
| | wildlife-rich areas (projects 3E1 and 5A within the HLF LPS WMM) | | | | resilient to change including climate change | |
| 6.7 | Coordinate delivery of actions in Ant Valley as described in WEG project | RSPB | BA, Butterfly Conservation NWT | 2019- 2020 | Fen is being restored, and removal of acidic influence protecting Fen Orchid colonies and understanding of ecohydrology and impact of groundwater input on habitat condition is improving | |
| 6.8 | Consult and decide on water abstraction licences based on ecological and hydrological evidence | EA | NE, BA, NFU, land managers and farmers | Ongoing | Protected areas that support sensitive water dependent habitats and species are being maintained and sites that have deteriorated are showing signs of recovery | |
| 6.9 | Respond to planning applications and policy consultations to support ecosystem management and species conservation (such as Net Gain) | BA and other appropriate organisations | - | Ongoing | Planning applicants and policy makers are understanding more clearly the impact of policy decisions on the Broads ecosystems and are making changes that improve ecosystem functioning | |
| 6.10 | Advise landowners and organisations, including Parish Councils, on managing land to extend more nature friendly land | NE and other appropriate | EA, local FWAGs, NRT, BA | Ongoing | Landowners are being supported by expert knowledge and the appropriate management is being undertaken, under clear | |

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|------|---|---------------|----------------------------------|------|--|--|
| | management and buffers for nature areas | organisations | | | agreements, to support achievement of biodiversity and wider environmental benefits | |
| 6.11 | Support development and implementation of Green Infrastructure and Recreational Avoidance and Mitigation Strategy to inform spatial planning decisions and policy | BA | Norfolk Strategic Planners Group | 2020 | The biodiversity value of sites is being protected from increasing recreational pressure and mitigation measures are being costed and put in place through Local Plans | |
| 6.12 | Develop Local Natural Capital Plan and Norfolk and Suffolk Nature Recovery Strategy and key sites for improvement | NCC, SCC | BBP | 2019 | The delivery of the 25-year Environment Plan is becoming better integrated through local natural capital plans for specific places in England | |

Table 7

Improve partnership coordination and communication of Broads biodiversity monitoring and research efforts, linked to national biodiversity network

| Ref | Detailed Actions | Lead | Partners | Timescale | Desired benefits | Progress |
|-----|---|------|---------------------|-----------|---|----------|
| 7.1 | Look for external funding for modelling of sea-level rise in Broads and likely impact on Swallowtail breeding sites (and those of other freshwater dependant species) | BCCP | Academic institutes | | Translocation is being more clearly recognised and used | |

| | | | | | | |
|-----|--|-----------------------|---|-----------|--|--|
| 7.2 | Research detailed ecology of Swallowtail and its food plant milk parsley, including impact of salty water on the plant | UEA | BBP, Swallowtail & Birdwing Butterfly Trust | 2019/20 | Potentially costly translocations are being based on more robust evidence, bringing more chance of success | |
| 7.3 | Disseminate findings of research on water connection and environmental degradation in influencing species distributions and potential for species recovery as water quality improves | Hydroscape (NERC) | BA, EA, NE | 2019-2020 | Water management organisations are acting from better understanding about the impact of water connection on the control of invasive species and diseases of wildlife and humans at international, national and local level | |
| 7.4 | Research movements of fish in Broads via fish tracking | Portsmouth University | EA, Anglers | 2018-2021 | Water management organisations and anglers have a better understanding about the impact of waterway management on fish movement and are creating sustainable fisheries | |
| 7.5 | Research historical microplastic pollution in Broads compared to more pristine waterways and report results to BBP and BCP | UCL | BA, NWT | 2019-2022 | The start time and extent of microplastic pollution is being understood more clearly | |
| 7.6 | Send all wildlife records to NBIS including setting up systems to support public to submit wildlife records | BBP | NBIS | Ongoing | Better species abundance and distribution data is informing development and management | |

| | | | | | | |
|-----|--|------|----------|-----------|--|--|
| 7.7 | Update research topics identified at Fen Research Workshop 2017 and Lake Review 2015, and send research opportunities to academic institutes to attract research students to work with BBP | BA | BBP | 2022 | Academic research in the Broads is supporting better management regimes | |
| 7.8 | Produce series of Broads wildlife identification books to promote public awareness and monitoring of species | NBIS | BBP, NCP | 2019-2022 | The public are recognising and reporting sightings of Broads species, creating stronger public interest and providing stronger data to inform management | |

(end of tables)

8 Broads biodiversity and water partners

Many organisations, groups and individuals contribute to the planning and implementation of actions in the Broads Broad Biodiversity and Water Strategy, including those listed below. Please note that this is not an exhaustive list, and numerous others help to care for the Broads.

Anglian Water is a landowner and provides a water supply to much of the Broadland catchment and sewerage services throughout the catchment.

The **British Reed Growers Association** represents reed growers from all parts of England, Scotland and Wales. The Association maintain close links with the thatching trade, environmental groups, government agencies and local authorities with the aim of promoting this important rural industry and maintaining our stake in the world market.

The **Broadland Catchment Partnership** aims to improve the water environment and provide wider benefits for people and nature through a coordinated catchment-based approach. The BCP is co-hosted by the Broads Authority and Norfolk Rivers Trust. Partners include Anglian Water, Environment Agency, Essex & Suffolk Water, NFU, Natural England, Norfolk County Council, Norfolk and Suffolk Farming and Wildlife Advisory Groups, Norfolk Wildlife Trust, River Waveney Trust, RSPB, Rivers Trust, Suffolk County Council, Suffolk Wildlife Trust, University of East Anglia and Water Management Alliance.

The **Broads Authority** has a statutory duty to conserve the natural and cultural heritage of the Broads, promote its understanding and enjoyment, and protect the interests of navigation. It is the local planning authority and a harbour and navigation authority. It conserves biodiversity and water on its nature reserves around the River Ant and on third party sites, furthering environmental policies and principles through planned development, education and community engagement.

The **Broads Biodiversity Partnership** seeks to improve biodiversity through a coordinated approach. The group is hosted by the Broads Authority. Partners include Norfolk Wildlife Trust, Suffolk Wildlife Trust, RSPB, Butterfly Conservation, Dragonfly Society, Anglian Water, Environment Agency, Essex & Suffolk Water, Natural England, Norfolk County Council, River Waveney Trust, Suffolk County Council, University of East Anglia and the Water Management Alliance.

The **Broads Climate Partnership** is a high-level forum to coordinate debate about climate change and sea level rise issues and options for the Broads. Its members include the Broads Authority, Environment Agency, Natural England, National Farmers Union, local authorities and the University of East Anglia.

The **Broads Environmental Education Network** (BEEN) involves around 40 organisations such as education bodies, charities, businesses and visitor attractions, all with a common

goal to improve people's understanding of the Broads. It supports the development of 'Broads Curriculum' online education resources for schools.

The **Broads Land Management Service** is a 'one stop shop' where conservation bodies working in the Broads can offer advice to landowners through agricultural advisors and services. Partners include the Broads Authority, Natural England, Norfolk/Suffolk FWAG, RSPB and the local Wildlife Trusts.

The **Broads Local Access Forum** is a semi-independent body established under the Countryside and Rights of Way Act. It advises the Broads Authority on improving and promoting public access to land within the Broads and adjacent parts of Norfolk and Suffolk.

Broads Tourism (Visit the Broads) acts as a forum for local tourism businesses. It aims to promote the Broads as a high quality, 'green' visitor destination through quality standards, staff training and clear, coordinated messages that define the area's status and special qualities.

Butterfly Conservation aims to halt and reverse the declines of the most threatened butterflies and moths in the UK.

Community Conservation Groups, Societies and Trusts: In and around the Broads are several initiatives that aim to enhance and record biodiversity, including Acle Lands Trust, Blofield and District Conservation Group, Little Ouse Headwaters Project, Norfolk Conservation Corps, Norfolk Rivers Trust, Norfolk and Norwich Naturalists Society, The Conservation Volunteers, River Waveney Trust.

The **Country Landowners Association** is the membership organisation for owners of land, property and businesses in rural England and Wales. It safeguards the interests of landowners, and those with an economic, social and environmental interest in rural land.

The Broads Authority Executive Area straddles two county areas (Norfolk and Suffolk) and six **local council** areas - Broadland, East Suffolk, Great Yarmouth, North Norfolk, Norwich City and South Norfolk. The councils provide a range of community services with planning being the most significant for biodiversity and water. The coastal councils are also coastal erosion risk management authorities.

Within the Broads area, the **Environment Agency** is responsible for water quality and resources, fisheries, conservation and ecology, and for the regulation of major industry, including waste, and the treatment of contaminated land. It is also responsible for managing flood risk from main rivers, reservoirs, estuaries and the sea.

Essex & Suffolk Water is a landowner, and supplies water to parts of the south and east of the Broads catchment.

The **Greater Norwich Development Partnership** involves Broadland, Norwich City and South Norfolk councils working together on a Greater Norwich Local Plan (GNLP), setting out a long-term vision and development objectives for the area, including biodiversity and water. The Broads Authority executive area extends into the JCS area and must be regarded in that strategy.

Internal Drainage Boards are independent public bodies responsible for managing water levels in low-lying areas. As the district land drainage authorities, IDBs supervise land drainage and flood defence works on ordinary watercourses.

Lead Local Flood Authorities manage the risk of flooding from surface water, groundwater and ordinary watercourses and lead on community recovery. Norfolk County Council and Suffolk County Council are LLFAs.

The **National Farmers Union** champions British farming and provides professional representation and services to its farmer and grower members. ‘Why Farming Matters to the Broads’ sets out an NFU vision to support and encourage a sustainable future for the Broads.

The **National Trust** is a charity working to preserve and protect historic places and spaces. It is one of the UK’s largest landowners and owner of a large number of heritage properties, including historic houses and gardens, industrial monuments, and social history sites. The National Trust owned and tenanted land around the Broads coast and the River Bure catchment has an overall aim to maintain and enhance biodiversity.

Natural England aims to enhance England’s wildlife and landscapes and maximise the benefits they bring to the public. It focuses on agri-environment land management, catchment sensitive farming, habitat and landscape conservation, coastal public access and National Trails, and conservation designation.

The **New Anglia Local Enterprise Partnership** works with businesses and public sector partners to help grow jobs in Norfolk and Suffolk. The two counties are global leaders in life sciences, food and agriculture and the ‘all energy’ sector. The LEP is also the Government’s Green Economy Pathfinder leader.

The **Norfolk Biodiversity Partnership** has a shared vision for the conservation, enhancement and restoration of the county’s biological diversity. The partnership run topic groups, such as the Communities and Nature as well as sponsored Biodiversity Awards each year.

The **Norfolk Coast Partnership** and the **Suffolk Coast & Heaths AONB Partnership** are designated as outstanding landscapes whose distinctive character and natural beauty are so precious that it is in the nation’s interest to safeguard them. Part of the Norfolk Coast AONB overlaps with the Broads Authority executive area.

Norfolk County Council and **Suffolk County Council** are responsible for a wide range of public services in their respective counties including social care, public safety, roads and

transport, education, environment and waste management. As highway authorities, their responsibilities include public rights of way for the Broads.

The **Norfolk Geodiversity Partnership** records, conserves and promotes appreciation of the county's geological and geomorphological diversity, through the Norfolk Geodiversity Action Plan.

The **Norfolk Non-Native Species Initiative** (NNSI) coordinates action and information for priority alien invasive species, including control programmes for mink and Floating Pennywort.

Norfolk Wildlife Trust and **Suffolk Wildlife Trust** are charities working to protect and enhance county wildlife and wild places including reserves, and promote environmental education. Norfolk Wildlife Trust is the oldest Wildlife Trust in the country.

There are 89 **parish councils** partly within the Broads Authority executive area. They are the level of government closest to the community, representing local interests, delivering services to meet local needs and working to improve community life and wellbeing, including the local environment.

The **RSPB** is Europe's largest nature conservation charity. It works across the UK to protect special places for wildlife, save species from extinction and create opportunities for people to experience and help protect wildlife and nature. It does this through its network of nature reserves, land management on third party sites, promoting environmental policies and principles, and environmental campaigns and education.

The **Whitlingham Charitable Trust** was set up in 1988 to manage Whitlingham Country Park as an open place where the public can enjoy quiet pursuits in a rural environment. The Broads Authority has responsibility for the day-to-day management of the Park and the Flint Barn visitor centre. Norfolk County Council manages the water space and Whitlingham Adventure.

The **Wild Anglia Local Nature Partnership** aims to enhance the natural environment of Norfolk and Suffolk through effective partnership working with business and communities, developing a series of discussions 'Wild Words'.

Appendix 1: Glossary

AECOM - contractor

AONB - Area of Outstanding Natural Beauty

AW - Anglian Water

BA - Broads Authority

BASG - Broads Angling Strategy Group

BBP - Broads Biodiversity Partnership

BBWS - Broads Biodiversity and Water Strategy

BCCP - Broads Climate Partnership

BCP - Broadland Catchment Partnership

BIFFA - Business waste company

BLMS - Broads Land Management Service

BLPS - Broads Landscape Partnership Scheme

BRASCA - Broads Reed and Sedge Cutters Association

BTO - British Trust for Ornithology

CAMS - Catchment Abstraction Management Strategy

CANAPE - Creating a New Approach to Peatland Ecosystems, EU Interreg

CS - Countryside Stewardship

CSF - Catchment Sensitive Farming

EA - Environment Agency

ELMS - Environmental Land Management Scheme

ESW - Essex & Suffolk Water

FWAG - Farming & Wildlife Advisory Group

HLF - Heritage Lottery Fund

IDB - Internal Drainage Board

INNS - Invasive Non-Native Species

LPS - Landscape Partnership Scheme

NBG - Norwich Bat Group

NBIS - Norfolk Biodiversity Information Service

NCC - Norfolk County Council

NCP - Norfolk Coast Partnership

NE - Natural England

NERC - National Environment Research Council

NNNSI - Norfolk Non-Native Species Initiative

Norwich CC - Norwich City Council

NRT - Norfolk Rivers Trust

NWT - Norfolk Wildlife Trust

SAC - Special Area of Conservation

SCC - Suffolk County Council

SSSI - Site of Special Scientific Interest

SWT - Suffolk Wildlife Trust

TBP - Trinity Broads Partnership

UCL - University College London

UEA - University of East Anglia

WCT - Whitlingham Charitable Trust

WEG - Water Environment Grant

WFD - Water Framework Directive

WMM - Water Mills and Marshes, HLF Landscape Partnership

Appendix 2: Links to more information

Anglian Water / Essex & Suffolk Water management plans www.anglianwater.co.uk
www.eswater.co.uk/your-home/Planning-for-the-future.aspx

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>

Broadland Catchment Abstraction Management Strategy
<https://www.gov.uk/government/publications/cams-broadland-abstraction-licensing-strategy>

Broadland Flood Alleviation Project www.bfap.org/

Broadland Rivers Catchment Flood Management Plan
<https://www.gov.uk/government/publications/broadland-rivers-catchment-flood-management-plan>

Broadland Rivers Catchment Plan (2014) <https://broadlandcatchmentpartnership.org.uk/>

Broads Angling Strategy (2013) <http://basgonline.org/document-library/>

Broads Biodiversity Audit (2011) http://www.broads-authority.gov.uk/data/assets/pdf_file/0020/412922/Broads-Biodiversity_audit_report.pdf

Broads Climate Adaptation Plan (2016) www.broads-authority.gov.uk/data/assets/pdf_file/0004/709159/Climate-Adaptation-Plan-Summary.pdf

Broads Education Strategy (2017) http://www.broads-authority.gov.uk/data/assets/pdf_file/0010/964270/Broads-Education-Strategy-2017-22-FINAL-APPENDIX-1.pdf

Broads Integrated Access Strategy (2013) <http://www.broads-authority.gov.uk/looking-after/managing-land-and-water/recreation-and-tourism/access>

Broads Fen Research workshop (2017) Presentation: http://www.broads-authority.gov.uk/data/assets/pdf_file/0006/994443/Kelly_Overview_-Fen-Workshop.pdf
Notes: http://www.broads-authority.gov.uk/data/assets/pdf_file/0004/994432/Broads-Fen-Workshop-2017-research-questions.pdf

Broads Lake Review (2015) http://www.broads-authority.gov.uk/data/assets/pdf_file/0006/549114/Broads-Lake-Review.pdf

Broads Lake Restoration Strategy (2008) http://www.broads-authority.gov.uk/data/assets/pdf_file/0007/412486/LakeRestorationStrategy.pdf

Broads Landscape Character Assessment (2006, update 2017) <http://www.broads-authority.gov.uk/planning/planning-policies/landscape-character-assessments>

Broads Reed and Sedge Cutters Association Action Plan [http://www.broads-authority.gov.uk/_data/assets/pdf_file/0019/416413/Action Plan for the Reed and Sedge Cutting IndustryMay2012.pdf](http://www.broads-authority.gov.uk/_data/assets/pdf_file/0019/416413/Action_Plan_for_the_Reed_and_Sedge_Cutting_IndustryMay2012.pdf)

Broads Volunteer Strategy (2017) http://www.broads-authority.gov.uk/_data/assets/pdf_file/0011/964271/Broads-Volunteer-Strategy-2017-22-FINAL-APPENDIX-2.pdf

Greater Norwich Joint Core Strategy www.greaternorwichgrowth.org.uk/planning/joint-core-strategy/

Making Space for Nature (2010) <https://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>

National Character Area profile: 80. The Broads (2015) <http://publications.naturalengland.org.uk/publication/11549064>

River Wensum Strategy https://www.norwich.gov.uk/info/20346/river_wensum_strategy

UK Government 25-year Plan for the Environment <https://www.gov.uk/government/publications/25-year-environment-plan>

Water, Mills and Marshes: Broads Landscape Partnership <https://watermillsandmarshes.org.uk/>

Appendix 3: Summary of achievements BBWS 2013-2018

This section highlights achievements from the Biodiversity and Water Strategy (BBWS) 2013-2018. It is set out under the headings in the Broads Plan (2017) with cross-referenced actions from the BBWS shown in [brackets].

Focus: Restoring, maintaining and enhancing water quality to achieve 'good' ecological status/ potential

Broads Plan Objective 2.1: Carry out lake restoration, maintenance and enhancement works; use monitoring evidence to trial and implement further innovative lake restoration techniques

[BBWS 2013-2018 Actions 1:1, 2.1]

- Hickling Broad reed swamp restoration carried out to benefit wildlife and reduce further reed swamp decline (BA, NWT)
- Further one hectare of reedbed creation underway at Hickling Broad (BA, CANAPE)
- Biomanipulation techniques investigated at Sotshole Broad to improve water quality and biodiversity (BA)
- Major lake restoration project underway at Hoveton Great Broad to improve water quality and enhance biodiversity (NE, EA)
- River Waveney fish by-pass/barrier removal project (EA, RWT) and Waveney TraC Project (BCP) carried out
- Fisheries tagging project implemented to map movement of pike and bream in Broads waterways (EA)
- Biomanipulation techniques trialled at Ranworth Broad to improve water quality and enhance biodiversity (BA, NWT)
- Annual water plant survey undertaken using improved methodology ; recovery of water plants in Hickling recorded (BA)
- River water plant survey extended, with overall improvement in aquatic plants; recovery of water plants in upstream reaches of rivers recorded (BA)

Broads Plan Objective 2.2: Promote and implement measures to reduce point and diffuse pollution into the floodplain and water courses, commensurate with EU/national water and habitat targets with sustainable farming

[BBWS 2013-2018 Action 2.3]

- Projects carried out to reduce agricultural run-off (soil, nutrients and pesticides) through WaterLIFE/WWF & Cola-Cola Partnership 2016-18 (NRT, RT), Tesco 2017 (BA)

- Ecosystem services mapped for water quality and surface water run-off risk (BA)
- Partners working with farmers and advisers on new environmental land management: workshop 2014 (NFU/BA), agri-environment meetings 2017-18 (BA, NE, NFU)
- Nutrients reduced in watercourses from public and private waste water: Septic tank campaigns 2014-18 (EA, AW), Keep it Clear Campaign 2014-18 (AW)
- Constructing wetlands project discussions held in 2018 (NRT, AW, EA)
- Water capture and water efficiency measures carried out through 'Love Every Drop' (AW) and 'Every Drop Counts' (ESW)
- Farm and water quality improvement projects carried out in 2015-18, e.g. Pesti-Wise (ESW), Slug it Out (AW)
- Wetland edge hydrological improvements achieved through three catch dyke projects (NE, BA)
- Two successful barrier deployments completed in 2018 to help protect c.100, 000 fish in boatyard at Potter Heigham (EA); modelling undertaken on other fish barrier solutions for the Broads to help protect fish from saline incursions (EA)
- More than 200 abstraction licence compliance and emergency planning visits prioritised in 2018 on Rivers Ant, Bure, Thurne and Wensum in 2018 (EA)
- 50 pollution prevention advice visits undertaken during 2018, visiting industrial estates at Fakenham and North Walsham to help protect the Broads river catchment (EA)
- Eleven engineered silt traps constructed in the Broads catchment since 2015 (BCP)
- Water abstraction licences relating to the Ant Broads and Marshes SSSI reviewed to help protect wetland habitats (EA, NE, BA)
- Hydro-ecology investigations undertaken for a number of fen sites, including Catfield and Barton Fens, to help understanding of water flow and management decisions.
- 121 Catchment Sensitive Farming grants paid to landowners between 2013-16, with more than 5,700 stakeholders engaged as part of CSF visits in 2018 (NE)

Broads Plan Objective 3.1: Maintain and enhance existing areas of priority fen, reed bed, grazing marsh and wet woodland through site management agreements/ prescriptions and support services to site managers

[BBWS 2013-2018 Action 1.1, 2.1]

- More than 130 turf ponds created in Ant valley of various sizes up to 0.5 ha (RSPB, BA)
- Grazing marsh reconnected to floodplain at Hickling Broad NNR, amounting to more than 40 ha (NWT, EA)
- BLMS engaged with 50+landowners over combined area of 2,000+ha to support creation of breeding wader habitat
- 13 ha scrub clearance and 3 km of ditch restoration completed and Fen Orchid counted and mapped at Sutton Fen and Catfield Fen (funded by WREN and HLS capital fen restoration grant) (RSPB)
- 1km of channel restored in Little Ouse Headwaters (LOHP)
- 34 km of reed margin managed for conservation at Trinity Broad (ESW, NWT, NE)
- Areas managed for commercial reed and sedge increased, with additional conservation cutting and scrub removal by reed cutters and support from Prince's Countryside Fund grant; 21 cutters now working in the Broad (BA, BRASCA)
- Fen habitat managed by BA: 180 ha in favourable condition
- Methodology developed for sensitive management of tree and scrub along river corridor, including purchase of tree shear machinery (BA)
- Softrack fen harvester and two excavators purchased for future sensitive management of wetland sites (BA)
- Creation and marketing of new products from reed developed through CANAPE project (CANAPE partners)

Broads Plan Objective 3.2: Define, implement and monitor management regimes for priority species

- Breydon Water retains accolade of 10th most important estuary for wintering birds with numbers between 80,000 and 120,000 in all years
- Wetland Bird counts (WeBS) completed annually at fourteen sites (BA)
- Fen Orchid recovery project undertaken at Sutton and Catfield Fens, with successful population increases to 12,000 plants (from less than 1,000 in 1996) and at twelve sub-sites; three translocations to former sites in 2017. Species no longer considered threatened (Plantlife)
- Fen raft spider population increased from one to four well-established sites, from two newly-established populations in 2013 (H Smith, NE, SWT, BA, Love the Broad)

- Swallowtail butterfly transects monitored annually at nine sites in the Broads (BC, Partners)
- Scarce vapourer moth recorded at Sutton Fen (RSPB)
- Booming and breeding bittern monitored annually at 25 sites in the Broads (RSPB, Partners)
- Between 9 -12 pairs of Crane sustained in the Broads between 2013-2018, with likelihood these pairs have produced birds to help populate other areas in UK.
- Broads barn owl project installed 50 nest boxes for barn owl and kestrel, all monitored annually with c.50 landowner visits completed to advise on habitat management and creation (BA)
- New subspecies of Lesser water-plantain (*Baldellia ranunculoides ssp. Repens*) discovered at Sutton Fen, Burgh Common and East Ruston Common
- Veilwort *Pallavicinia lyellii* discovered at Barton Fen in 2014 by J Parmenter, a new record for the Broads.
- Important populations of bladderwort (*Utricularia intermedia s.s*) found at Catfield Gt Fen and potentially at Upton Decoy subject to verification
- Eight fen vegetation monitoring transects established on priority vegetation types to record long-term change in relation to climate changes and sea level rise
- 200 grazing marsh ditch points surveyed across Waveney valley to review ecological status of plants and invertebrates since 1997 survey
- Grass-wrack pondweed (*Potamogeton Compressus*) turions being retained during weed cutting management (Broads IDB)

Broads Plan Objective 3.3: Define, implement and monitor management regimes for invasive non-native species

[BBWS 2013-2018 Action 2.6]

- Mink workshop 2014 (NBIS, BA), Wensum balsam bash 2017 (NCC), Floating Pennywort removal 2014-18 (EA,RWT, BA)
- More than 130 non-native species control and advice programmes completed between 2013-2017 including contract spraying and ongoing eradication at Snipe Marsh (BA)
- Floating Pennywort eradication continuing on River Waveney

- More than 400 mink rafts/traps on loan to c.300 volunteers from Norfolk Mink Project; more than 300 mink caught between 2013 and 2018 in Broads river catchment.

Focus: Extending and creating new areas of high biodiversity value habitat, habitat networks and buffer zones within the Broads catchment

Broads Plan Objective 4.1: Create ‘bigger, better and more joined up’ areas of priority habitat by identifying opportunities and developing site specific plans for new habitat areas, connections, buffer zones and pollinator networks

[BBWS 2013-2018 Actions 1.2, 2.1, 2.2]

- Visitor surveys conducted at EU protected sites across Norfolk to inform impacts of housing development 2015-16 (LPAs)
- Norfolk Habitat mapping, Green Infrastructure Mapping 2018 (NCC), and Broadland Catchment Partnership Ecosystem services opportunity mapping 2014-17 (BA) carried out
- WMA, Broads IDB, RSPB, BA and NE successfully obtained EA grant for Halvergate Fleet scheme. 4.5km high level water carrier, creating scrapes and wet areas to benefit breeding waders, climate change mitigation and wetland species.
- 140 ha added to Carlton Marshes nature reserve near Lowestoft, creating a 404ha landscape-scale nature reserve and visitor centre
- 66 ha added to Berney Reserve and 444 ha restored to create conditions for breeding and wintering birds
- 40 ha of new wetland added at Potter Heigham Marshes, including 20 ha of reedbed to compensate for anticipated loss of European-designated reed beds on East Anglian coast due to future sea level rise and coastal erosion
- 35 ha ‘Drake’s Fen’ purchased south of Sutton Fen to extend fen management
- 6 ha of new sites added to Little Ouse Headwaters Project across three sites
- Successful funding drawn in: Carlton HLF and other £5M (SWT); CANAPE EU Interreg £1.2M (BA); Water Mills and Marshes HLF £4.5M (BA); Hoveton Broad EU LIFE and HLF £1.9M (NE); WREN land purchase Loughlin’s at Berney £974K (RSPB); Hickling donations and Garfield loan £1M (NWT); HLF £153K and Esmée Fairbairn Foundation £60K (LOHP)

Broads Plan Objective 4.2: Improve partnership coordination and communication of Broads biodiversity monitoring and research efforts, linked to national biodiversity network

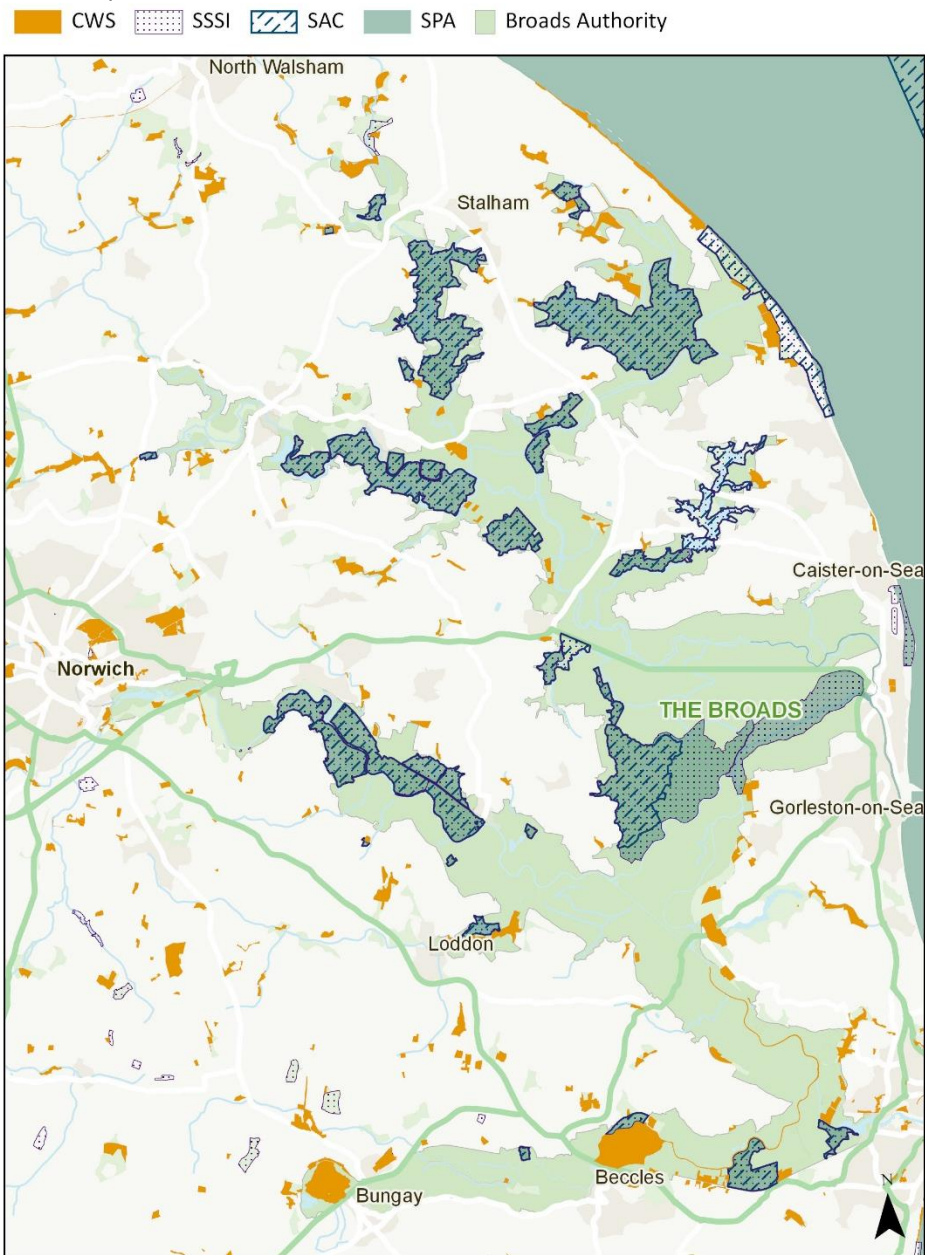
[BBWS 2013-2018 Actions 3.1, 3.2, 3.3, 3.4, 3.5, 3.6]

- National Chartered Institute of Ecology and Environmental Management CIEEM Award received for Little Ouse Headwaters Project
- 3 individuals gained NBP awards for their work in the Broads, 8 Norfolk FWAG farm conservation competition entrants, 4 runners up and 1 winner of the Ian MacNicol Memorial trophy, 1 National FWAG/Waitrose Silver Lapwing award winner
- 8 new fen vegetation monitoring transects set up with transects planned at Sutton and Catfield in 2019 (BA)
- Aquatic macrophyte survey undertaken annually with more than 20 years of species data (BA)
- Turf ponds surveyed annually for plants with complementary invertebrate surveys (BA, RSPB)
- Catch dykes in Bure and Ant valleys assessed and baseline data collected at three sites (NE, BA)
- Long-term salinity study being developed for Reedham marsh dykes and How Hill (BA)
- Annual monitoring of breeding barn owl/kestrel and other nest boxes undertaken (BA, NRG, volunteers)
- Broads school project carried out to understand fen peat depth to support peatland management (CANAPE)
- Wild Watch Camera Project public engagement project underway (HLF, BA)
- Post Graduate research undertaken to further environmental understanding in the Broads:
 - Phoslock PhD - Centre for Ecology and Hydrology 2015-2018
 - Carbon in fens two PhDs - Queen Mary University London 2013-2016
 - Killer shrimp PhD - Kings College London
 - Salinity in Thurne PhD - University College London 2015 - 2018
 - Flooding modelling prediction PhD – UEA 2016 - 2019
 - Fen dyke investigation MSc – UEA 2013

- Investigating Upper Thurne pumped catchment MSc – Cranfield University 2017
- Relationship between Fen Orchid and red deer at Sutton and Catfield MSc – University of South Wales
- Investigating nutrient and sediment at Sutton fen MSc - Cranfield 2013
- ‘Is Sutton Fen natural’ investigating peat at Sutton– QMUL 2016
- Vegetation preferences by fen raft spiders with view to informing ditch management- Birkbeck
- Prymnesium PhD - John Innes Centre
- Known universities working in the Broads: Cranfield, QMUL, UCL, Kings College London, University of South Wales, Stirling, Edinburgh, CEH, UEA and John Innes Centre (Norwich), Birkbeck (London), Glasgow, Lancaster
- Major research bids/grants/projects more than £10k including NERC Hydroscape, ARISE, SWARR, Prymnesium
- 10 cuckoos tagged in Broads to help investigate significant decline in UK migratory bird numbers 2013-18
- Nathusius pipistrelle project 2018: 43 surveys, 20 sites, 31 volunteers, estimated 650 volunteer hours, 81 Nathusius pipistrelles ringed
- Norfolk Bat Survey demonstrated importance of Broads for bats including barbastelle, Nathusius pipistrelle and Alcaethoes
- Scientific papers published Scopus searches using ‘Norfolk Broads’ and ‘Broadland’ in last 5 years resulted in 5 peer reviewed publications

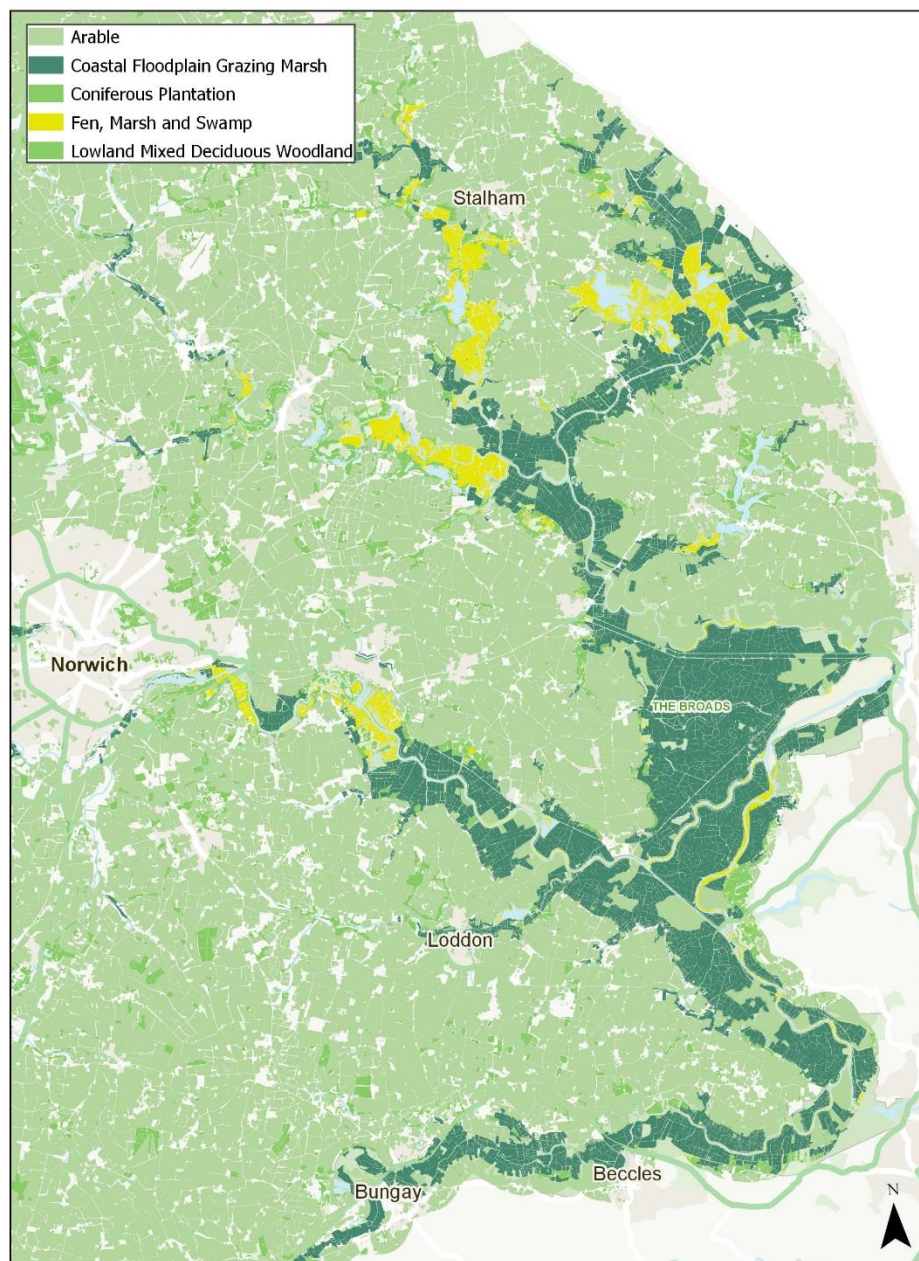
Appendix 4: Maps

Designations map



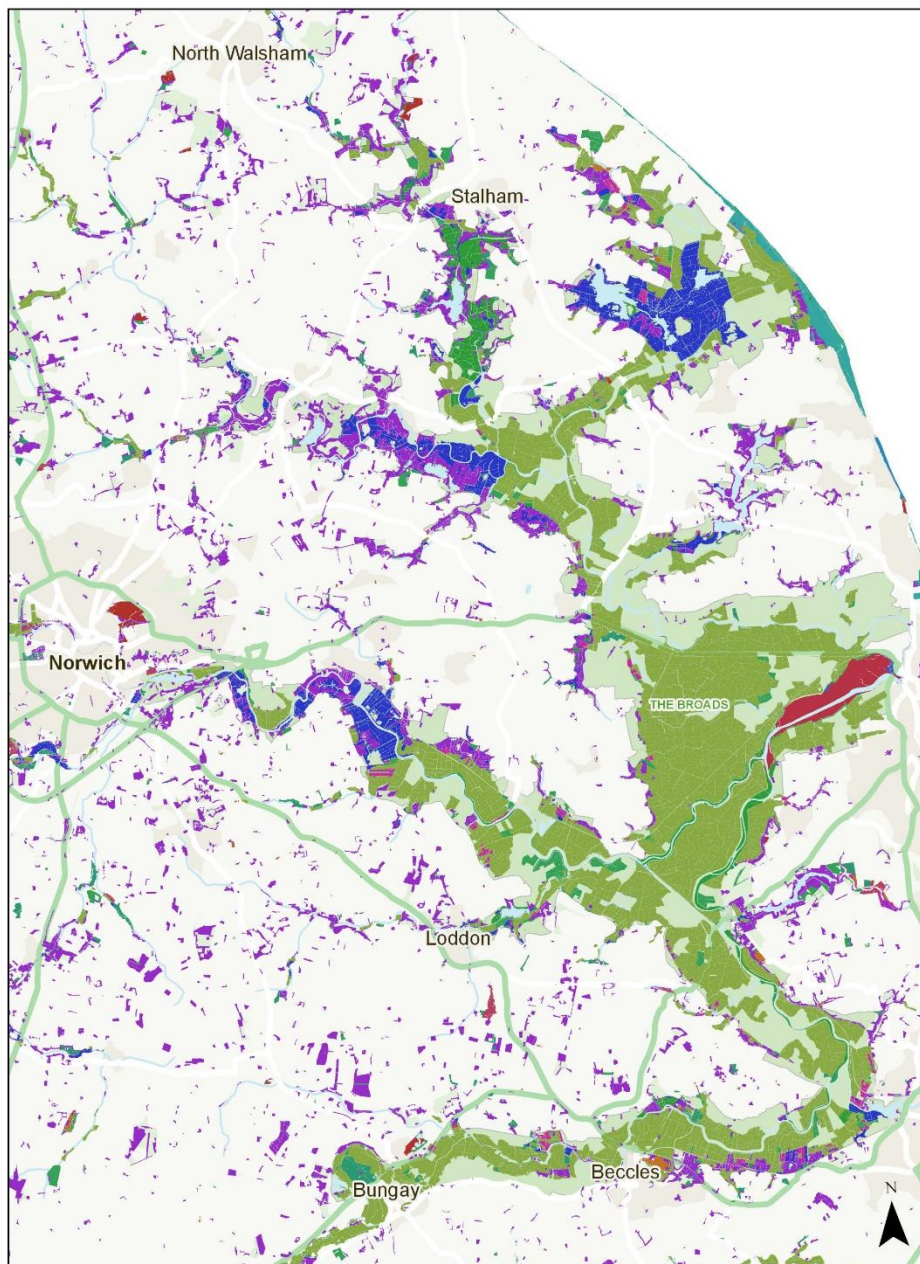
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Norfolk habitat map (2011)



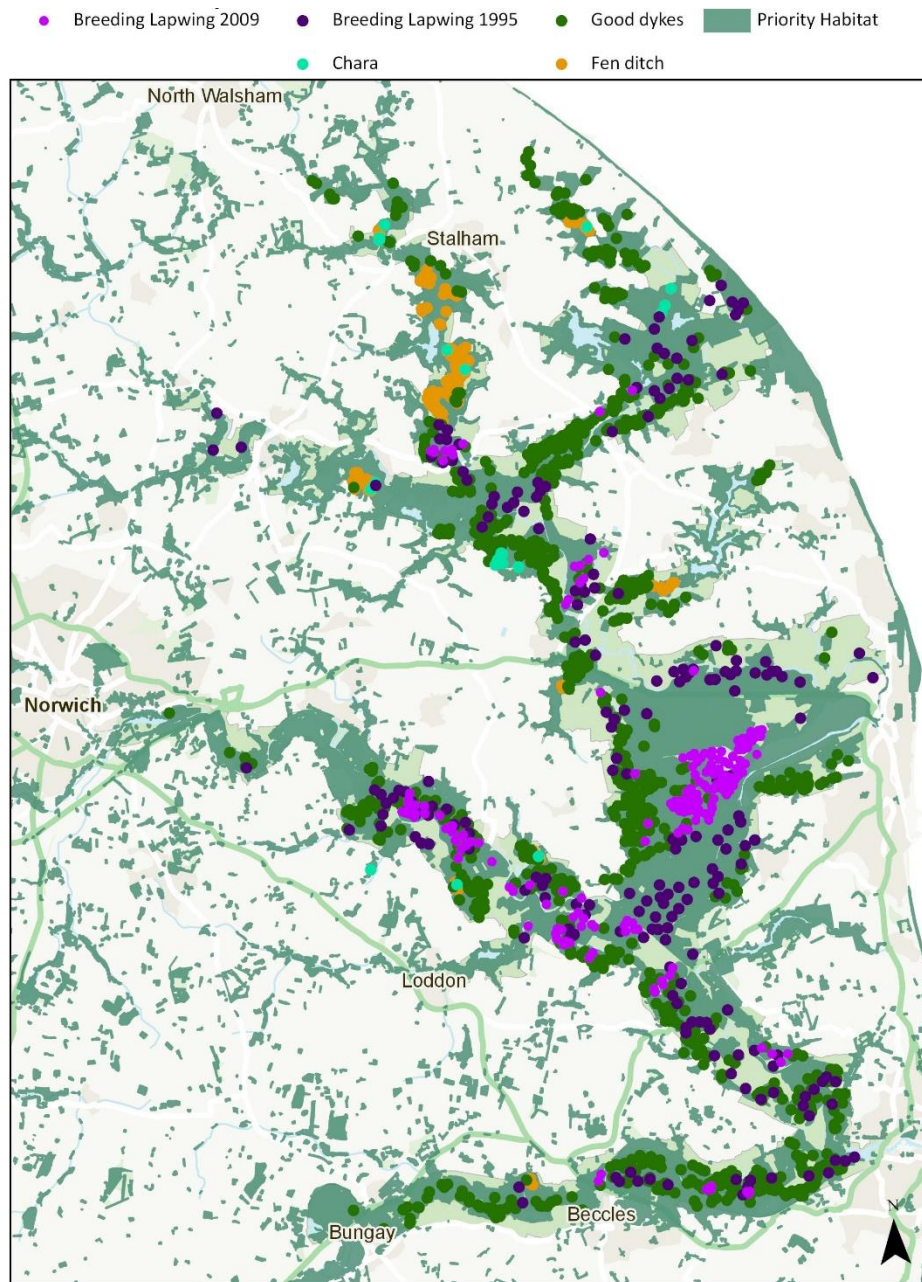
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Priority Habitat inventory map (2015)



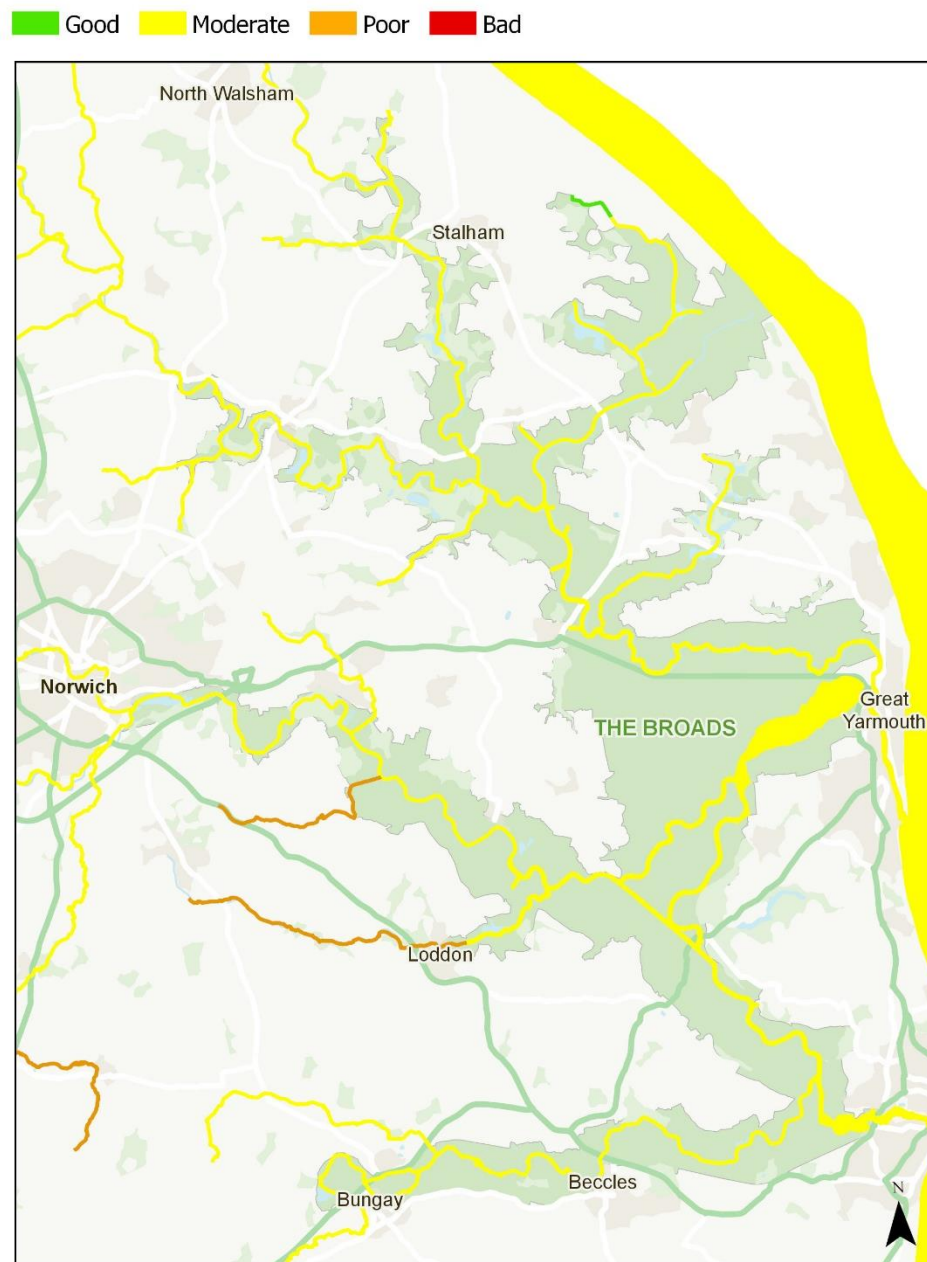
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Habitats and species map



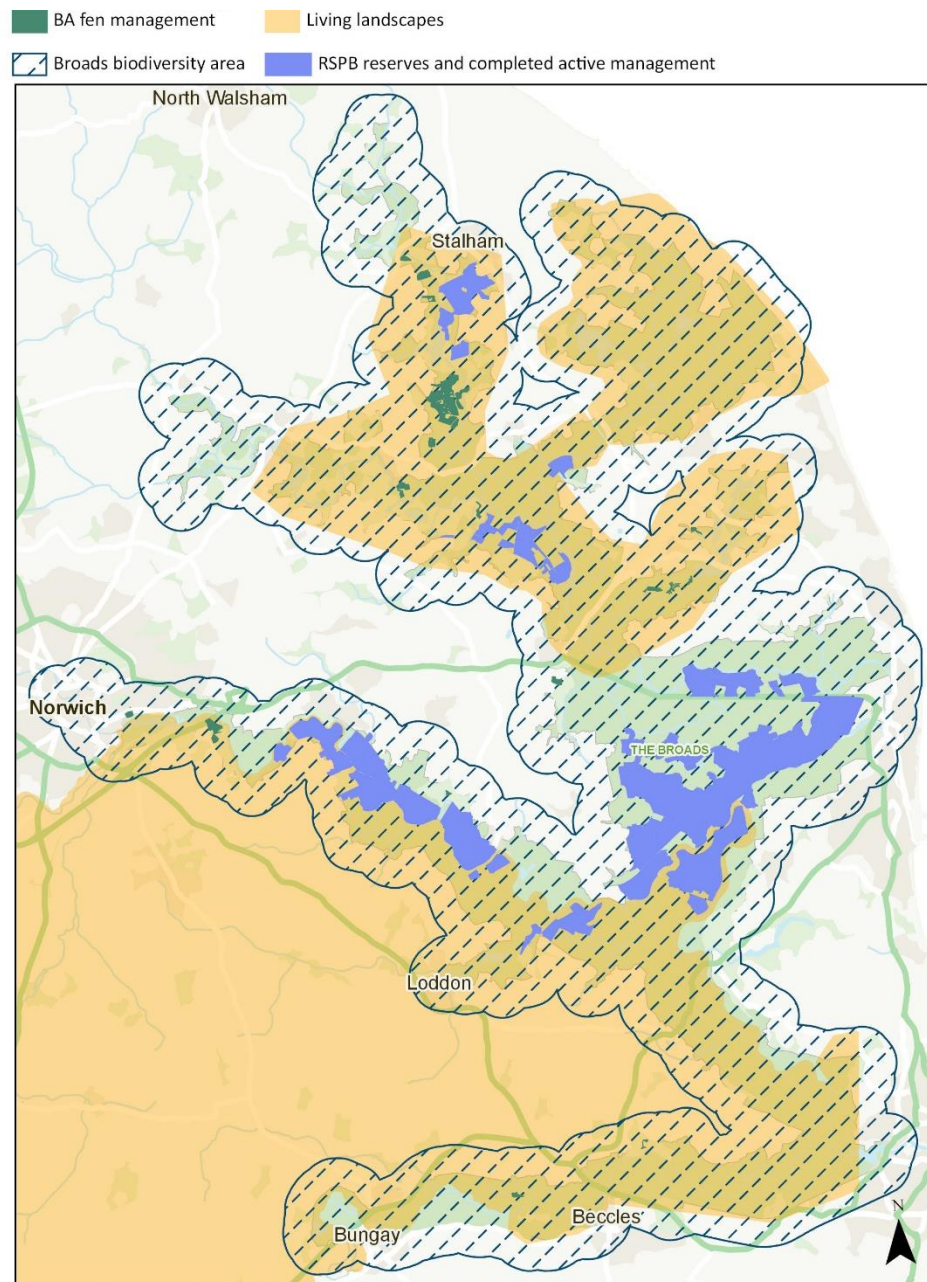
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Ecological status map (2016)



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Active management map (2018)



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Footnotes

ⁱ [RAPID LIFE](#) project (2017-2020) A holistic approach to Invasive Alien Species management in freshwater aquatic, riparian and coastal ecosystems across England

ⁱⁱ State of Nature Report (2016) DB Hayhow, F Burns, MA Eaton, N Al Fulaij, TA August, L Babey, L Bacon et al - The State of Nature partnership

ⁱⁱⁱ State of the UK Climate (2017) Supplementary report on Climate Extremes. Met Office, National Climate Information Centre

^{iv} The Intergovernmental Panel on Climate Change (2018) Latest predictions

^v Bradley, S. L., Milne, G. A., Teferle, F. N., Bingley, R. M. & Orliac, E. J. (2009) Glacial isostatic adjustment of the British Isles: new constraints from GPS measurements of crustal motion. *Geophysical Journal International*, 178, 14-22.

^{vi} Environment Agency (2015) The Value of Angling in Essex, Norfolk & Suffolk (ENS) Area; A summary of published facts and figures relevant to freshwater fisheries

^{vii} Border JA, Newson SE, White DCJ, Gillings S, (2017) Predicting the likely impact of urbanisation on bat populations using citizen science data, a case study for Norfolk, *Landscape and Urban Planning* (162)