2021 River Basin Management Plan

Biodiversity challenge Published: October 2019

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1. Summary

Water and wetlands are a vital part of our natural world that people and wildlife depend on for their survival. They also bring great enjoyment, enriching our lives through our experiences living and working alongside the natural world, in our cities and towns, the countryside and coast.

However, many of our water dependent habitats like coastal and freshwater wetlands, rivers, lakes and ponds have been lost, isolated, modified and polluted, and species that depend on them are in decline. Many that remain are dependent on having enough good quality water to sustain them. Their existence is threatened by pressures from our use of land and water, either directly or within their wider catchments.

In the UK we've lost 90 per cent of our wetland habitats in the last 100 years and over 10 per cent of our freshwater and wetland species are threatened with extinction. Two thirds of existing species are in decline. Wetlands make up only 3 per cent of the UK but are home to around 10 per cent of all our species, so they are vital for the species that remain.

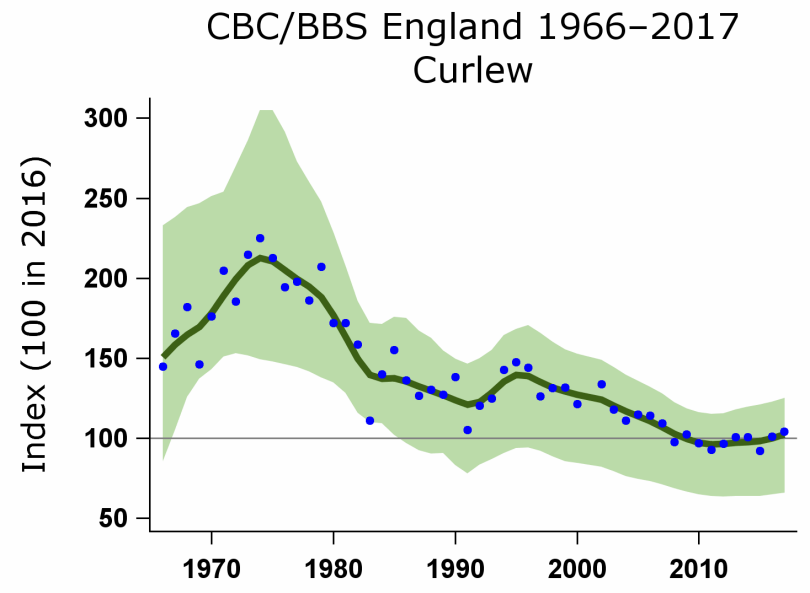
There has been considerable effort and investment to manage pressures on the water environment and to reverse these declines over recent decades but our waters and wetlands remain under threat. As environmental pressures and public demands on them increase, we are beginning to fully understand how vital they are in helping people and wildlife adapt to an uncertain future. We need a step change in how we plan and coordinate investment and action.

Example 1: Curlew population change.

The curlew, an iconic bird of farmland, wetlands and coasts, has declined dramatically to 'Near Threatened' global status, and has been called 'the most pressing bird conservation priority in the UK' (Brown, D., Wilson, J., et al). There is good evidence that loss of habitat is the main cause of decline of curlew. Part of the decline of the species is likely to be correlated to draining of wet grasslands and other wetlands. The conservation of curlew is likely to benefit from wader friendly management of land, including restoration of wet features within fields and more varied vegetation (Woodward, I.D., Massimino, D., et al).

Photograph 1 Eurasian Curlew © Natural England

Figure 1. Graph showing population of curlew in England (1966 to 2017)



Smoothed population index, relative to an arbitrary 100 in the year given, with 85 per cent confidence limits in green. CBC stands for Common Bird census and BBS stands for Breeding Bird survey (BTO and JNCC Bird Trends Report, 2018).

Example 2: Pond conservation.

Ponds play a very important role in the conservation of wetland wildlife (Williams, P., Whitfield, M., et al) and are part of our social history. However ponds are subject to a range of pressures including being filled in, dried out, pollution, and changes to the hydrological cycle as a result of climate change. At a national level it is estimated that pond numbers in England and Wales decreased by around three-quarters during the 20th Century from a maximum of about 800,000 to around 200,000 by the 1980s (Williams, P, Biggs, J, Crowe, et al). Findings from the 'Water Friendly Farming Project' (Williams, P, Biggs, J, Stoate, et al) suggest that measures such as flood and sediment interception features could bring some biodiversity benefits; and the creation of clean water ponds specifically targeted for biodiversity may hold considerable potential to help stem, and even reverse, ongoing decline in freshwater plant biodiversity across farming landscapes.

Photograph 2. Pond created in unimproved grassland in Oxfordshire © FHT 2016

Making new ponds, one of the most popular freshwater habitat management measures, is looking increasingly effective as more data on the effects of clean water pond creation become available, both within the Water Friendly Farming project and elsewhere. The pond above, created in unimproved grassland in Oxfordshire, is now one of Britain's most important ponds.

2. Biodiversity pressures

Our nation's wildlife and their habitats continue to be under significant pressure, reflected in the fact that only 16 per cent of England's water bodies are at good ecological status (GES). Water and wetland habitats and the species they support are affected by a wide range of natural and human-made pressures e.g.

- climate change and other emerging challenges
- physical modification
- pressures from rural land management and agriculture
- pollution from wastewater discharged from water treatment works
- pollution from rural areas and towns, cities and transport
- changes to water levels and flows
- invasive non-native species
- habitat fragmentation

These can directly affect species or lead to the break up or loss of the habitats that they rely on. How individual pressures effect biodiversity is dealt with in detail in the Challenges and Choices consultation. The following provides the context and examples of these pressures on biodiversity, highlighting the relationships between river basin planning and biodiversity policy and legislation, and outlines some of the approaches required to address these challenges.

3. Addressing the challenge

3.1 What needs to be achieved?

Healthy functioning coastal, estuarine, freshwater and wetland habitats support thriving species populations and provide resilience to changing climate conditions.

Water dependent habitats should be able to function as naturally as possible to maintain the full range of characteristic wildlife, and support and connect with adjacent wetland and terrestrial habitats. Natural processes generate a changing mosaic of high quality habitats within which each species has a place to live, including rare and threatened species. To address the threats to these habitats, we should seek, where possible, to work with natural processes to protect, enhance and restore these habitats and the systems on which they depend.

Restoring healthy water dependent habitats involves a range of actions, including controlling pollution, abstraction and non-native species, changes in land management practices, removing physical modifications, and re-establishing natural flora and fauna. Such restoration generates high quality aquatic and wetland habitat for our native wildlife. It also brings benefits for people, including improvements to downstream water quality, resilience of water supplies and reduced flood risk, along with recreation opportunities, and increased health and well-being.

3.2 Ambition and opportunity

The government's 25 Year Environment Plan (25YEP) highlights both the intrinsic value of our natural environment and wildlife, and the important benefits that a healthy functioning environment can provide society. It sets out an ambition to develop *a* growing and resilient network of land, water and sea that is richer in plants and wildlife. To achieve this ambition we need to do more for nature and at a greater pace. The key opportunities to address the challenges to our nature and wildlife include:

- restoring sites protected for their wildlife and habitats
- native species recovery and reintroduction
- building ecological networks and creating additional habitats to offset losses

As well as protecting species and habitats all of these actions have the potential to restore and increase the natural assets (e.g. soil and water, pollinating insects) that we rely on.

3.3 Restoring protected sites and priority habitats

Protected sites (see explanatory note 1) embody some of our best natural and semi-natural habitats and support a wealth and diversity of wildlife. The 25 YEP reaffirms the importance of these sites and sets out an ambition to restore 75 per cent of the million hectares of terrestrial and freshwater protected sites to favourable condition. Incorporated within this wildlife ambition are aims to reach or exceed objectives for rivers, lakes, coastal and ground waters that are specially protected for biodiversity.

River basin management plans aspire to restore and improve the condition of all waters, by aiming to restore good ecological status or good potential. In addition they have a role to ensure that land and water use planning takes account of the sites, habitats and species that are specially protected or recognised for their biodiversity importance, with specific requirements for water dependent Natura 2000 sites (additional information on these can be found in the Natura 2000 narrative in this Challenges and Choices consultation).

To meet the challenges within the wider landscape and realise the ambition set out in the 25 YEP for restoring protected sites, we need to take the opportunity to integrate other requirements for improvements in biodiversity set out in national legislation and policy e.g. for Sites of Special Scientific Interest (SSSIs) and Priority Habitats.

A high proportion of SSSIs, protected in law for their national importance, comprise habitats or support species that are strongly water dependent. Many of these SSSIs are also WFD water bodies. The pressures impacting on these waters are the same, and measures that deliver improvements for water bodies toward meeting Good Ecological Status, can also help meet the conservation objectives of SSSIs, either directly on the water body or through improvements across the wider catchment. In some situations, these sites have different and sometimes more stringent targets to meet in order to restore healthy functioning ecosystems (for water quality and/or flow parameters). Depending on the particular wildlife features for which a SSSI is designated, the measures and timescales to address the pressures, and so meet the targets may be different.

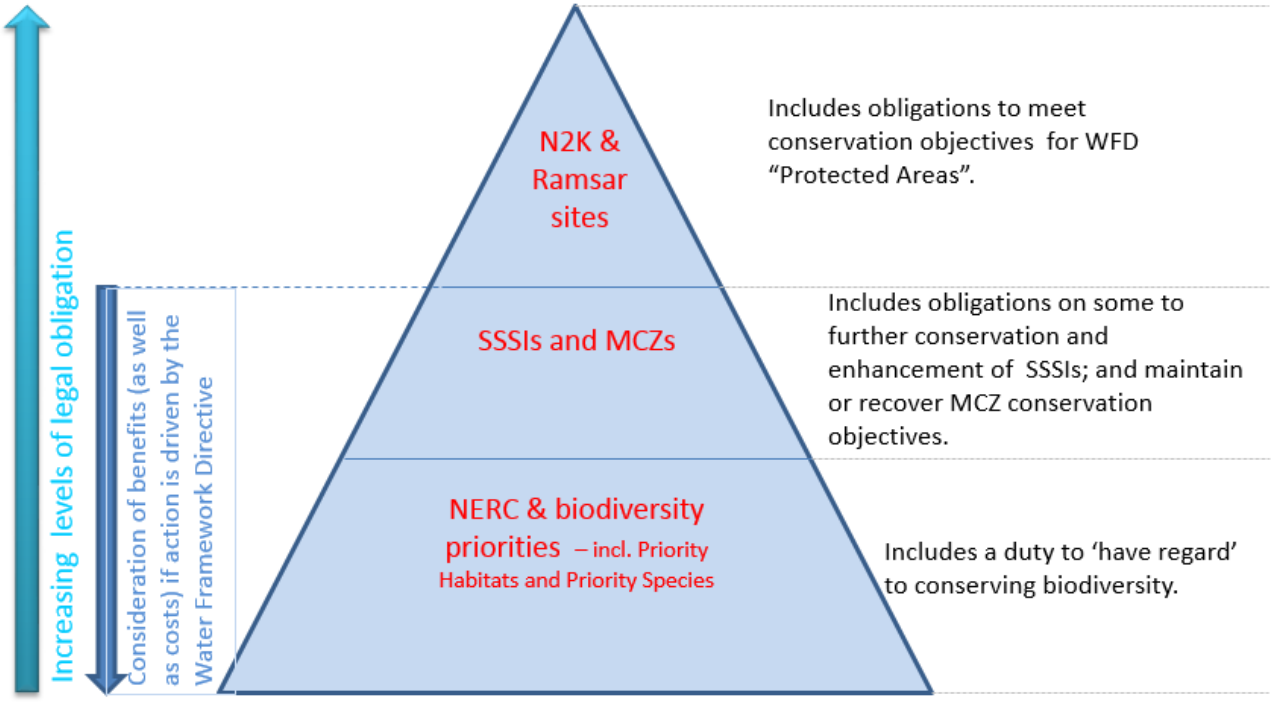
Priority habitats cover a wide range of semi-natural habitat types, and can exist within or outside Natura 2000 protected areas or SSSIs. These priority habitats, are given legal status through The Natural Environment and Rural Communities Act 2006 (the NERC Act). Section 41 of the Act sets out those habitats which are of principal importance for conserving biodiversity in England. Many of these priority habitats are water dependent e.g. reed beds, saltmarshes. Some of these, including lowland raised bog, or some river headwaters are not classified as WFD water bodies but are very important habitats, supporting a host of species. These habitats are often fragmented or under threat, and the most recent land use change statistics in England report a declining trend in the rate of new habitat creation, which is insufficient to offset the loss of habitat. The 25 YEP sets out an ambition to create or restore 500,000 hectares of wildlife-rich habitat to help address and reverse this trend.

River basin management plans apply out to 1 nautical mile offshore, and so offer an important opportunity to help protect coastal and marine habitats. By linking actions that help address issues such as pollution from land that impact on rivers and estuaries, the adverse effects on coastal habitats that may result, can also be reduced, and especially on those protected through the new marine conservation zones (MCZs).

Explanatory note 1: The main national and international designations and classifications given to areas of land, inland water and the sea, to protect or recognise their significance for wildlife

- Natura 2000 sites (N2K) are European-wide network of areas protected for biodiversity, comprised of Special Areas of Conservation (SAC) for different habitats and Special Protection Areas (SPAs) for birds. Natura 2000 sites are one type of Protected Area under the WFD and as such are given special consideration within river basin planning.
- Ramsar sites are wetlands of international importance designated under the Ramsar Convention. The same considerations are given to Ramsar as Natura 2000 sites through river basin planning.
- Sites of Special Scientific Interest (SSSI) represent some of the country's very best wildlife and/or geological sites, and designated and protected in law for their national importance.
- Marine Conservation Zones (MCZs) protect a range of nationally important marine wildlife and habitats in inshore and offshore waters. (NB European Marine Sites give legal protection to species and habitats of European importance).
- Priority habitats (PH) that are of principal importance for conserving biodiversity. They exist within and outside specially protected sites.

Figure 2. Represents these different levels and categories of special protection, and the degree to which biodiversity and ecosystem enhancement is driven by legal obligations and the need for economic considerations.



3.4 Native species recovery and reintroduction

There have been significant declines in species and ecological communities in England over the past 50 years, and we have lost some formerly native species. Urgent action is needed to arrest the decline in native species, protect threatened species and their habitats, in order to restore our biodiversity.

The 25 YEP includes a target to take action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human induced extinction or loss of known threatened species in England. The management of Natura 2000 sites and SSSIs make a significant contribution to the conservation of these species but significant numbers, and their range, fall outside designated site boundaries. When planning water body and catchment interventions, the needs of species should be considered. This includes measures that benefit the recovery of priority and specially protected species, particularly those water and wetland dependent species listed under Section 41 of the NERC Act e.g. freshwater pearl mussel, salmon and white-clawed crayfish.

Native species, such as the European Beaver, have been lost from our water environment and their reintroduction, where carefully planned and managed, could enrich our natural environment and provide wider benefits. They are often referred to as ecosystem engineers for their ability to manage the habitat around them. Working with, and reintroducing natural processes, they can restore river and wetland habitats that other wildlife can use, people can enjoy, and contribute to wider ecosystem services.

3.5 Building ecological networks

Creating a wider network for nature to thrive, has been proposed within the 25 YEP through establishing a Nature Recovery Network (NRN). The ambition is to create and restore 500,000 hectares of wildlife rich priority habitats, more effectively linking and buffering existing protected sites and landscapes, and bring the network into our towns and cities. As well as helping wildlife to thrive, the network has the potential to contribute to wider benefits, such as carbon capture, pollination, water quality improvements, flood risk mitigation, and wider public enjoyment and understanding.

This rationale builds on that set out by Sir John Lawton in Making Space for Nature, which proposes that wildlife recovery requires more, bigger, better and more joined up habitats. A step change is required in the approach of nature conservation to one of large scale habitat restoration and creation, underpinned by the reestablishment of ecological processes, also helping provide ecosystem services.

Our rivers, lakes, ponds, estuaries, and wetlands are natural corridors and stepping stones for wildlife that intersect and connect many landscapes. Current measures to improve water body ecological status, and specially protected site condition are instrumental in restoring these ecosystems. However, improvements to our waters and wetlands cannot be fully realised by simply concentrating on the waters themselves. Restoring connectivity across the landscape, allows species to migrate and adapt, and increases the resilience of wetland and water dependent habitats and species to pressures from climate change.

The creation and restoration of habitats in key parts of a catchment can also contribute to reducing pressures, inputs and demands affecting the wider water environment, providing a range of ecosystem services including water purification and reducing run off of excess water from the land. The loss of key rural pollutants such as nitrate, phosphorus, sediment, from natural and semi natural habitats, can be significantly lower than from adjacent more intensively managed rural land, (e.g. where some of these habitats continue to be managed for more traditional extensive forms of agricultural production).

The speed and quantity of runoff generated can also be far lower from natural and semi natural habitats than from adjacent intensively managed rural and urban land. This can help manage flood risk and has a significant impact on water quality because of the dilution and process effects. Less runoff means less pollutant loss, and greater dilution (concentrations are lower and frequency of peak losses that can impact on downstream river habitats and wetland sites is reduced). The corresponding increased recharge of water into the ground leads to higher base flow into rivers and streams, and water for dependent wetlands.

4. Future challenges and actions

4.1 Existing mechanisms

There have been, and are continuing measures being used to help address the pressures on biodiversity, preventing deterioration of waters and wetlands (since it takes effort and investment to stand still in the face of increasing pressures) as well as making positive progress.

These include large national programmes such as environmentally focussed farming support, water company investment in environmental programmes and habitat creation as part of flood risk management schemes.

Action at a local level, through catchment partnerships, and the work of bodies such as the local rivers and wildlife trusts, and numerous other local initiatives have also been fundamental and hugely important in helping restore biodiversity, and taking forward the measures in the current river basin management plans.

4.2 Developing new approaches

The increasing pressures on the natural environment and water dependent habitats and species mean that new approaches are required to ensure the conservation objectives for specially protected sites and priority habitats and species can be met, and that natural capital and ecosystem services are not further diminished. Some of these approaches could include (but are not exclusive to):

- restoring or creating more wetland and water dependent habitat and water features, as part of 500,000 ha ambition, creating both direct benefits for wildlife alongside wide ranging benefits for society
- modifying surrounding land use (urban or agricultural) in catchments of ground and surface water-dependent sites to increase resilience and safeguard specially protected wildlife
- restoring natural processes in freshwater, wetland and coastal systems where appropriate, to increase resilience to future climate change and other challenges. New Guidance (2018 Biodiversity Pack) for managing freshwater and wetland habitats in this way is available from CaBA, and the underpinning principles and evidence explained in Natural England's A narrative for conserving freshwater and wetland habitats in England
- building on existing measures to restore populations of priority species such as the freshwater pearl mussel, salmon and white-clawed crayfish alongside other priority water-dependent species
- supporting carefully planned and managed re-introductions of native species, where they make positive changes to land and water management
- new mechanisms to help deliver some of these approaches are under development including the new Environment Land Management Scheme (ELMS)

Potential tools also include conservation covenants. Legal agreements where land owners can secure positive environmental outcomes over the long term.

Biodiversity net gain is an approach which aims to leave the natural environment in a measurably better state than beforehand. Government have signalled their intent to mandate biodiversity net gain through the forthcoming Environment Bill and it is embedded in the National Planning Policy Framework.

4.3 Opportunities for sectors to work together better

Local place based initiatives such as the Catchment Based Approach (CaBA) are central to water management and supporting wildlife. Defra's Catchment Based Approach Policy Framework (May 2013) requires a strategic catchment wide approach that works in collaboration with local partners to manage the water environment. This catchment wide approach focuses on the management of water as a whole system from source to sea and has the potential to better join up fragmented habitats and restore ecological functioning.

Many of the key issues we now face are more complex, intractable problems involving multiple pressures acting in combination, and therefore require action with multiple sectors, which local partnerships are well placed to facilitate.

The 25 YEP reinforces the importance of a wider approach to resolving problems and incorporating multiple benefits through a whole systems approach and local place based planning.

We continue to need a more inclusive approach to local place based partnership working that facilitates holistic management of all parts of the catchment system (environmental, social and economic). Local partnership working does not necessarily have to be based on catchment boundaries, but needs to continue to adopt a source to sea approach.

There are particular initiatives focussed around water quality improvements. These include catchment scale permitting and nutrient balancing schemes, and for water resources where the Governments Abstraction Plan sets out options for taking a wider catchment approach. There are also examples of catchment wide initiatives around dealing with invasive non-native species.

There may also be new ways that water companies, industry, agricultural and other sectors, consumer groups, environmental organisations and individuals can work together to make the step change required to address the challenges to biodiversity in the water environment.

We are interested to hear your ideas and understand any changes that need to happen to improve this cross sector working, and build on the catchment based approach to address the particular pressures on biodiversity.

5. Case studies

5.1 Addressing the biodiversity challenge through the 2021 update to the river basin management plans (RBMPs)

Previous river basin management plans have endeavoured to make progress across all water body types, challenges and pressures. However, it is recognised that the rate of progress on issues, has not always been consistent. For example, this may be due to it being easier to tackle single issues in some locations rather than multiple impacts, or that more resources are available in terms of volunteer effort or finance than in others. In the 2021 update to the RBMPs the aim remains to make progress in improving the water and wetland environment across the board, although there are some biodiversity issues that that we anticipate having a renewed focus on. These include but are not limited to, species conservation, lakes, small water bodies and headwaters, and diffuse water pollution impacts on specially protected sites.

5.2 Lakes and other standing water bodies

There are many thousands of lakes and other standing waters, including habitats such as ponds in England. Approximately 5700 lakes above 1 hectare in size (Bennion et al), and an estimated 231,900 ponds below 1 hectare (Williams, P, Biggs, J, Crowe). All lakes above 50 hectares, those designated as Natura 2000 sites above 5 hectares in size and many SSSI lakes are recognised as WFD water bodies.

In England, over 70 per cent of SSSI lakes are in unfavourable condition and over 80 per cent of Water Framework Directive (WFD) lake water bodies do not meet good ecological status or good ecological potential. Lakes are often subject to multiple pressures and the legacy these issues leave behind (e.g. pollution being retained in lake sediments) can be very challenging and take a long time to make progress on improving the condition of these waters. In the 2021 update to the river basin management plans, our intention is to put increased emphasis on progressing measures for lakes and other standing waters, particularly those that are specially protected for their biodiversity interest. Restoration of ponds, is also important as they are integral to the biodiversity of the landscape and act as stepping stones connecting fresh water habitats.

Case study: Elterwater SSSI.

Elterwater SSSI is situated in the Lake District and consists of three distinct interconnected basins. It supports a diverse series of habitats including open water, fen, marshy grassland and woodland. Elterwater received discharge from the local waste water treatment plant from 1974 to1999 and the inflows had also been altered, probably in the 1940s. Septic tanks also contribute nutrients.

This has resulted in a nutrient enriched lake, and whilst the major inputs have now ceased, the reduced flow through the system meant that the nutrients

were not leaving Elterwater resulting in degradation of the special shoreline and in-lake plant communities.

Photograph 3 Elterwater SSSI

A project has been undertaken to restore the hydrology, through piping water and re-routing some of the inflows. This should start to flush Elterwater, helping rid the lake of the nutrients that have accumulated over time. It may also help prevent the lake from becoming oxygen deficient which can lead to an increased release of nutrients from the sediment.

A key septic tank issue has now been dealt with and a new Water Environment Grant project is looking at restoring the remaining diverted inflows. Monitoring is ongoing to see whether this is sufficient to improve the water quality and biology of this designated site.

Case study: Hatchmere SSSI in Cheshire

Hatchmere SSSI in Cheshire, is an internationally important Ramsar site, designated for its varied lake and wetland plant communities. It is also important for birds and insects including the rare hairy dragonfly and variable damselfly.

This is one of the many sites where nutrients that have accumulated in the sediment are released into the water column. There is no large single contributor of nutrients into the lake, instead there are likely to be more small sources within the catchment. The hydrology of the lake has also been significantly altered. The lake level is lower than it has historically been, an inflow channel has been created where once the lake was fed by groundwater, and the surrounding land has been drained. This has not only impacted the surrounding wetlands, but delivered nutrient enriched water to

reach the lake. The lake is also home to a number of introduced carp, a species which is known to uproot aquatic plants and re-suspend the sediment, which can result in turbid nutrient enriched water. Consequently the lake has lost all of its submerged aquatic plants and the wetland is drier than it should be affecting the special wildlife and ecosystem functioning.

Photograph 4 Hatchmere SSSI in Cheshire (Image courtesy of CWT).

A range of approaches are being tried to address these issues. Ditches around the mere have been blocked. Phoslock has been applied to try and reduce the release of phosphorus from the sediment, but whilst there was an initial reduction, the persistence of too high a nutrient input from the catchment, insufficient phoslock and carp disturbing the sediment have been suggested as reasons why this did not work.

A Water Environment Grant project is now looking at the impact the fish community is having, by excluding fish from some areas of the lake to see if lake water quality will improve and aquatic plants will be able to grow in these areas. Work will be undertaken to re-naturalise the inflow, improving wetland habitat and reducing the direct delivery of nutrient rich water into the site. While this should improve Hatchmere it is likely that phosphorus will continue to be released from the sediment for some time and any continuing sources of nutrient input need to be identified and stopped. Decisions about the fish community in the wider lake will also need to be made once the results from the exclusion zones are known.

5.3 Diffuse Water pollution

Diffuse water pollution can originate from a range of sources, and is a key pressure on many waters and wetlands. Some sites specially protected for their biodiversity (mainly Natura 2000 and some SSSIs) have bespoke Diffuse Water Pollution Plans (DWPP), agreed between EA and NE to deal with diffuse water pollution issues. DWPPs outline the main catchment pressures and sources of pollution alongside work to progress any investigations, or modelling needed to better understand what's

needed to achieve objectives, as well as implementing already identified measures being undertaken during the current river basin management plans. Due to their complexity, for many sites we don't have all of the answers and it's unlikely we will have identified all of the necessary measures. However we can take an adaptive management approach based on what we do know, implementing no regrets measures in the 2021 update to the river basin management plans that we know to be beneficial.

Case study: Marazion Marsh

Marazion Marsh an example of addressing diffuse water pollution impacts on sites specially protected for biodiversity

The adaptive management approach is being demonstrated at Marazion Marsh in Cornwall. Situated in a shallow river valley, and containing Cornwall's largest reed bed, it is designated as a Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA Natura 2000 site) for a range of wetland habitats, passage and wintering birds, and dragonflies.

Photograph 5 land draining into Marazion Marsh (Image courtesy J. Oliver, Natural England).

Marazion Marsh is downstream of a highly fertile and productive catchment specialising in early vegetable and flower crops, as well as being the location of a local quarry. The site is being severally impacted by excess sediment and nutrients; but some features of the site are recovering due to the presence of a Higher Level Stewardship management agreement in place with the RSPB for reed bed cutting and scrub management. However, the agreement does not address the quality of the water entering the marsh. The DWPP highlighted a need for monitoring to determine the rate of sedimentation and

nutrients entering the site and to determine the current water quality levels across the various inflows. Once completed, this modelling developed the understanding of where to target measures to achieve the reductions needed. Due to the complexity of the issues an adaptive management approach toward reducing sediment and nutrient inputs, through a combination of targeted Catchment Sensitive Farming advice and land management incentives delivered through Countryside Stewardship agreements, along with enforcement visits where existing regulations are not being met, was needed. This allows these measures to be deployed and their effectiveness reviewed across the site. It was felt this was more appropriate than going straight to further regulatory action and large scale land use change, where the source of all nutrients is still unclear. Local feedback is that this has already had a positive impact on the site and farming operations.

The reduction in sediment and nutrients should improve water quality and ensure that the reed bed and fen habitats remain suitable for the SPA qualifying species, the bittern and the aquatic warbler, along with the other bird assemblages, insects and plants for which the site is notified as a SSSI. The site will continue to be reviewed and if sufficient improvements in condition are not realised, additional measures (including a water protection zone) remain on the table to be taken forward.

6. Choices

Question 1: What can we do to address this biodiversity crisis and meet the 25 year Environment Plan targets for wetlands, freshwater and coastal habitats and wildlife?

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