

The Welland Valley Partnership

Enhancing the River Welland

Our invitation to support a new vision for the local environment



January 2013



Foreword

The Welland Valley Partnership - Working Together for a Better River

The River Welland arises above Market Harborough and flows through the gently rolling countryside of Northamptonshire, Leicestershire and Rutland until it reaches Stamford where it is one of the features that makes the town so attractive. Below Stamford the River continues on its way to Market Deeping and Spalding, where its character changes and the water slows down to become one of the four fenland rivers which drain the Fens and finally enter the Wash.

People have relied on the Rivers for thousands of years for water, food, transport and energy; as a result the River Welland and its valley have changed enormously. Even the course of the River Welland has moved; it used to flow through the Trinity Bridge in Crowland, but now runs almost a mile away and the bridge is a dry monument in the centre of the town.



Figure 1: Trinity Bridge at Crowland. This triangular bridge once provided a crossing place over two channels of the River Welland. (©Dave Hitchborne and licensed for reuse under the Creative Commons Licence)

While many of these changes have been beneficial, such as the creation of water meadows which were an important feature of the English countryside, others have had unintended side effects. For example, land drainage and the extensive dredging of the River upstream of Stamford have left us with an over-widened and over-deepened channel with little of its historic character. Other newer pressures are also affecting the River; for example sediment running off fields and highways stifles the bed of the river and the animals and plants which try to live there.

You may have seen the draft plan we produced in April 2012 to inform people of our work and to invite comments. This is the full Plan which brings together the work and aspirations of many people and organisations and sets out an agenda for the actions still needed to enhance the River. Much is being done at local level and much more is planned, but there is still a need for others to get involved. However, while we can achieve much, it will be important that Government continues to support the work that is needed through creating clear policies to improve our rivers and provide the funding to deliver it.

What has also become increasingly clear through our discussions is that improving the River has many benefits not just to wildlife but to people as well; for example, community work on the Mill Stream in Stamford by a band of volunteers has cleared the overgrown channel and also created a new footpath for people to enjoy. These multiple benefits mean that we all need to work to identify activities that will benefit us in many different ways. We know that rivers will always flood and that this may be catastrophic or merely a nuisance, but we also know that floodwater can remove excess sediment and nutrients such as phosphate from the River. Consequently there are considerable opportunities to take a much larger view of the River and its catchment to ensure that we look at these wider benefits and at the potential for delivering them.

The Welland Valley Partnership was set up to determine what we can all do to enhance the river and its tributaries. The Welland Rivers Trust was set up by volunteers who want to see a better River and who want to play a part in making that happen, so we are pleased to be part of the Partnership and to play a central role in taking some of the actions forward.

This document is just the start of the process and the Welland Valley Partnership is about communities, organisations and companies working together to improve the River; we want you to become part of that partnership and to play whatever role you can to make the river something which is healthy and beautiful, a wonderful resource for wildlife and a valued amenity. We want to hear from you with your views, suggestions and (ideally) offers of help to make the Welland, its tributaries and its valley a better place – contact us at info@wellandrivertrust.org.uk or via our website www.wellandrivertrust.org.uk.

Peter Barham

Chairman, Welland Valley Partnership Steering Group and Trustee of the Welland Rivers Trust

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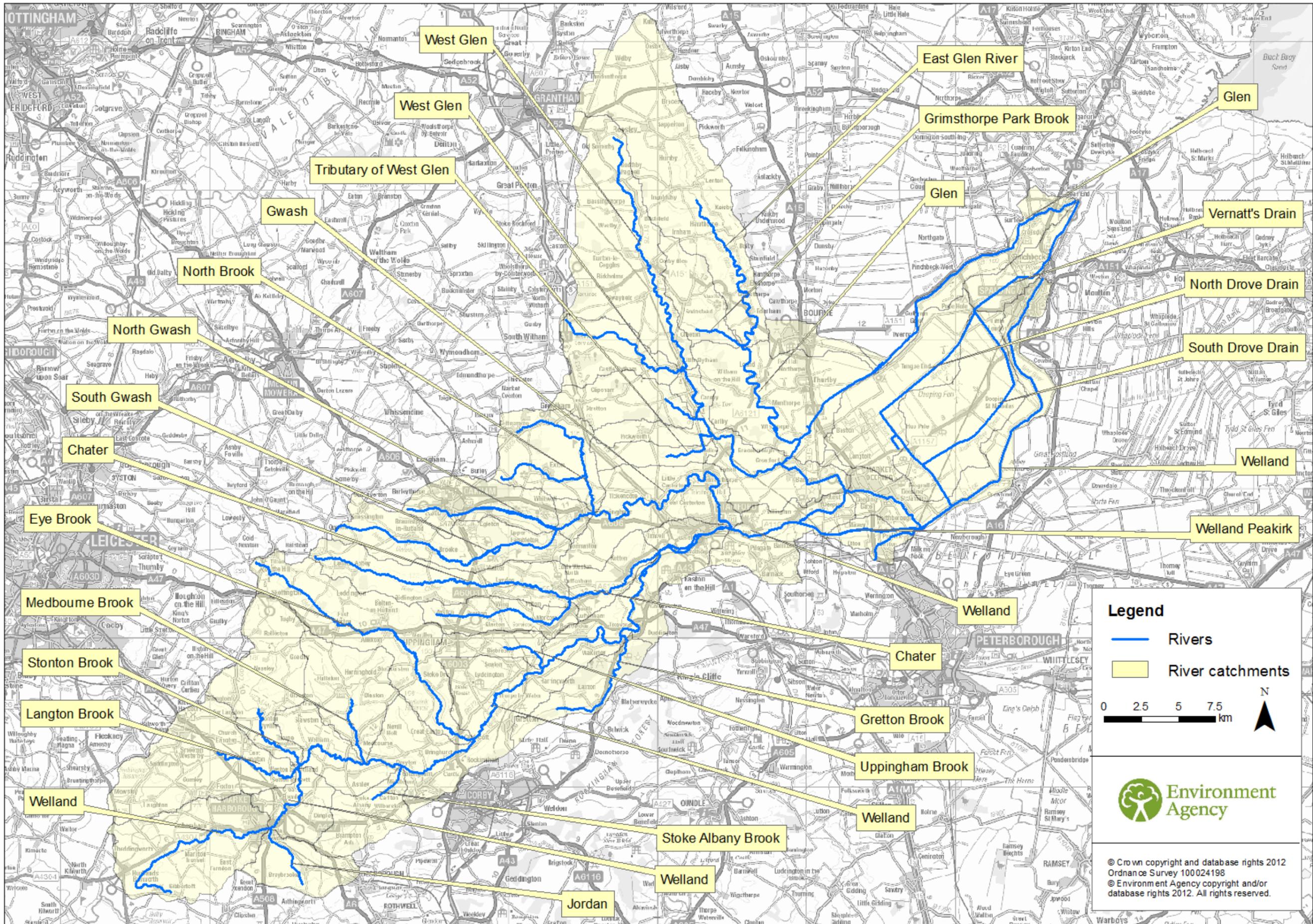


Figure 2: The River Welland Catchment from source to tidal outflow

1. Our Vision for the Welland Valley

Our vision is that the River Welland, from its source near Market Harborough, Leicestershire, through to the tidal limit at Spalding, Lincolnshire, including all the many tributaries will:

- Be cleaner and healthier
- Continue to provide drainage and manage flood risk
- Support more fish, birds and other wildlife
- Meet the needs of drinking water suppliers and businesses
- Provide a more attractive place for people to enjoy
- Be sensitively managed by everyone whose activities affect it

We will achieve our vision by working with everyone who wants to help us, including individuals, land managers, farmers, local communities, businesses, voluntary organisations, local authorities and government agencies.



Figure 3: Volunteers at the Stamford Mill Stream Clean Up day in October 2012. Over 200 people from the community and local businesses helped to build upon the work of the Stamford Millstream Project carried out so far. (Dave Sones/WRT)

How everyone can help

We are already taking action to enhance the River and its tributaries, drawing on a wide range of contributions from different people and organisations. This is only a start and there is still so much more we can all do.

To make a significant difference to the health of the River, and to multiply the benefits it brings for everyone in the Welland catchment, we want to draw on as many ideas and as much support from local people as possible.

Here are some ways in which you can help us realise our vision:

- **Businesses** – could you sponsor our projects or provide volunteer working parties to help us make practical improvements?
- **Land managers** – could you take advantage of our advice and Partnership grants to help tackle diffuse pollution and enhance river habitats?
- **Parish Councils** – could you encourage local people to support our projects to enhance the River and its tributaries?
- **Wildlife Trusts** – could you offer ideas for extending and linking wildlife sites to benefit wildlife?
- **Schools** – could you encourage projects in art, poetry, prose or science which raise awareness about the River?
- **Householders with septic tanks** – could you act on our 10-point Action Plan for managing septic tanks?

Here are some ways in which **everyone** can help as an individual:

- Send us your ideas or aspirations for the River or its tributaries in your local area
- Tell us how you use the River at the moment (walking alongside it, fishing, etc.)
- Provide stories and photographs, past and present, to help us understand the River's history
- Support the Welland Rivers Trust as a member or volunteer
- Switch to using low-phosphate laundry and dishwasher detergents
- Use water sparingly and responsibly

To let us know what you are doing in the Welland Valley, if you want advice about how you can improve it, or to tell us what you think, contact the Project Officer.

Email: info@wellandriverstrust.org.uk

Phone: 07710 592110

**Post: Department of Biology, Adrian Building, University of Leicester, LE1 7RH
or Welland Rivers Trust registered address c/o GWCT, The Allerton Project, Loddington House, Main Street, Loddington, Leicester, LE7 9XE**

You can also leave a message on our website (www.wellandriverstrust.org.uk), where we also provide up to date information on our work in the Welland Valley.

2. The Welland Valley

The Welland Valley collects water from the River Welland and its tributaries over an area of approximately 600 square miles, with more than 300 miles of waterway. The River Welland itself is a relatively small, and in many parts, beautiful river typical of lowland England, rising near Sibbertoft on the Leicestershire/Northamptonshire border, flowing through Market Harborough, Ketton, Stamford, The Deepings, Crowland, and Spalding, and entering The Wash at Fosdyke. The landscape through which the Welland and its tributaries flows is varied, from the livestock-dominated land of the upper Welland, through market towns and larger settlements, into the arable-dominated fenlands of Lincolnshire and highly modified channels below Spalding out to the Wash.



Figure 4: Upper Welland in May 2010 (N. Keshav)



Figure 5: Harringworth Viaduct with the River Welland in the foreground (@ Ian Yarham and licensed for reuse under the Creative Commons Licence)

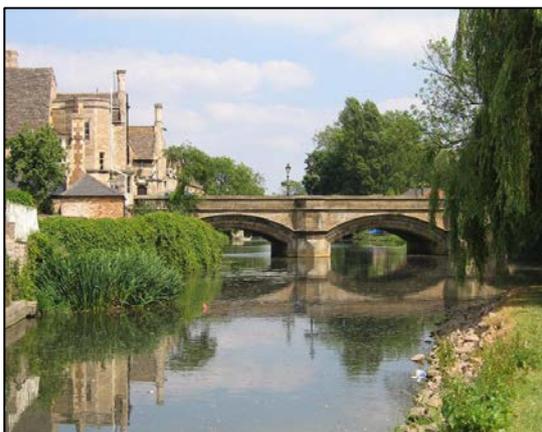


Figure 6: Town Bridge over the River Welland at Stamford



Figure 7: Welland High Bank at Deeping St Nicholas (WRT)

The recorded history of the Welland stretches back several thousands of years. It ranges from Stone Age remains at the edge of the Fens, evidence of Roman settlements at River crossings, through the rise of medieval Stamford, and the impressive Victorian viaduct at Harringworth. The Welland and its tributary rivers have seen great changes in particular over the last 100 years; changes in land use and industry have had both positive and negative impacts on the Valley. The Eyebrook Reservoir was created in the 1930s to provide water for industry in Corby, but now provides an excellent habitat for birds and is a popular fishing location. The once controversial 'Empingham Reservoir' was built in the 1970s to provide water for the growing towns of Peterborough, Kettering and Northampton. Now known as Rutland Water, it is nationally regarded as a

major tourist attraction supporting many recreational activities. It is an internationally important site for wildlife, in particular over-wintering wildfowl.

The once-natural meandering Rivers have been straightened and deepened by major engineering works, especially during the 1960s and 1970s as part of flood alleviation and land drainage programmes mostly affecting the catchment upstream of Stamford. In the Lincolnshire Fens, the River had been widened, straightened and deepened over many years to avoid inundation of agricultural land, allowing increased production of food. The shrinkage of peat in the fens has left much of the land below sea level, so the drainage programmes and work of the Internal Drainage Boards in the area is even more paramount in protecting people and property from flooding. Human activities in the Valley have also degraded riparian habitats and water meadows, with knock-on effects on water quality, water supply and wildlife. The traditional practice of flooding river meadows has been lost.

The River Welland provides many services that we often take for granted, but need to safeguard for now and in the future, such as:

- Drinking water
- The capacity to mitigate flooding by drainage and holding high flows within the channel
- Water for livestock and irrigating crops
- Enjoyment through activities such as fishing, boating, walking and wildlife watching
- A high quality environment for the wildlife species that live in and around the river

The health of the River can be indicated by the quantity of water flowing down it, the chemical components within it and the species that live in and on it. A healthy river is able to provide all the services we seek, but protecting, maintaining and enhancing this create a substantial challenge. This will be exacerbated by the continuing impact of climate change on water flows, the need to produce food, and the pressures arising from development to provide new housing, employment opportunities and infrastructure. The Welland Valley Partnership was formed to promote activities to help restore a healthy river, but the impetus for its formation came from the EU Water Framework Directive.

The Water Framework Directive

The European Water Framework Directive (WFD) became part of UK law in December 2003. It provides a framework for investigating, planning and delivering a better water environment using ecology and chemistry. The WFD applies to surface waters including lakes, rivers and streams, ground waters (aquifers), estuaries and coastal waters.

The Environment Agency has assessed the 'ecological status' (or health) of all water bodies in England and Wales by studying fish, macrophytes (aquatic plants), diatoms (a type of algae), invertebrates (e.g. insects), chemical factors such as phosphate and dissolved oxygen, and river morphology.

The WFD requires us to assess the health of each stretch of the Welland and its tributaries, improve poor stretches, prevent deterioration, protect drinking water sources, promote sustainable use of water and reduce all types of pollution.

The assessments have led to each water body being graded by its Ecological Status: High, Good, Moderate, Poor or Bad. A river in its natural state has 'High' status. The Directive requires all water bodies to be of Good Ecological Status (or Good Potential Status) by 2015. This River Improvement Plan shows how the Partnership intends to work towards this. Where it is not possible to achieve good status by 2015, we must have put in place a programme of measures showing how we aim to achieve Good Ecological Status beyond this date.

The current status of the Welland and its tributaries

The Welland and its tributaries, from its source to the tidal limit at Spalding, have been split up into 33 separate water bodies for WFD assessment, of which only six have been identified as being in Good Ecological Status. A 'reasons for failure map' of the catchment has been produced by the Environment Agency (see Appendix 1). Appendix 5 gives details about each 'reason for failure'. The reasons behind the failures are complex and need to be fully understood before measures can be put in place to ensure a healthier river.

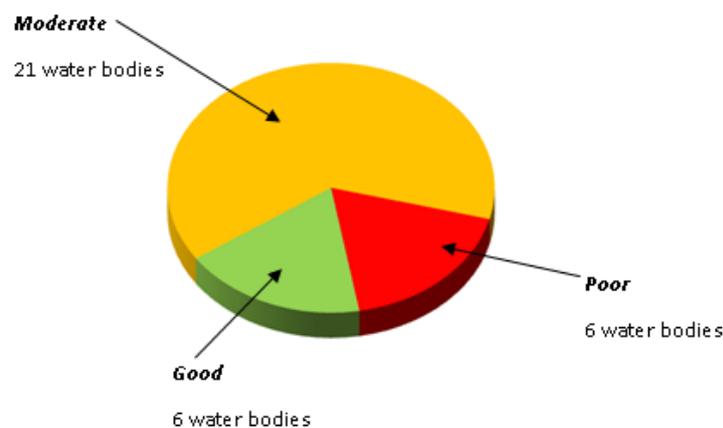


Figure 8: The proportion of water bodies in the Welland catchment, from its source to the tidal outflow at Spalding, in Good, Moderate or Poor Ecological Status

In 2011, the Government asked organisations in 10 'pilot catchments' to work in partnership to improve rivers and bring about wider environmental and social benefits. The River Welland was chosen as one of the 10 original pilot catchments because of its characteristics as a low-lying and slow-flowing river modified for flood defence through rural and urban landscapes.

On World Water Day, 22nd March 2011, Richard Benyon MP, Minister for Natural Environment and Fisheries, announced the Pilot Catchment Initiative, stating that these pilots should:

'...provide a clear understanding of the issues in the catchment, involve local communities in decision-making by sharing evidence, listening to their ideas, working out priorities for action and seeking to deliver integrated actions that address local issues in a cost effective way and protect local resources.'

The Welland Valley Partnership

The Welland Valley Partnership was formed in August 2011 to achieve these government goals. It includes local authorities, businesses, charities and interest groups. We think that the best way to improve the Welland Valley is to identify challenges and tackle them together, from local level upwards. Since our formation, we have welcomed new partners and will work to recruit others who wish to help us achieve our vision.

We initially focused our attention only on the catchment upstream of Spalding as per the original pilot boundary area. In 2012, we extended our remit to include the Glens, significant parts of the Fens and limestone aquifers. Over the next year we will ensure that the whole catchment is included in our work.

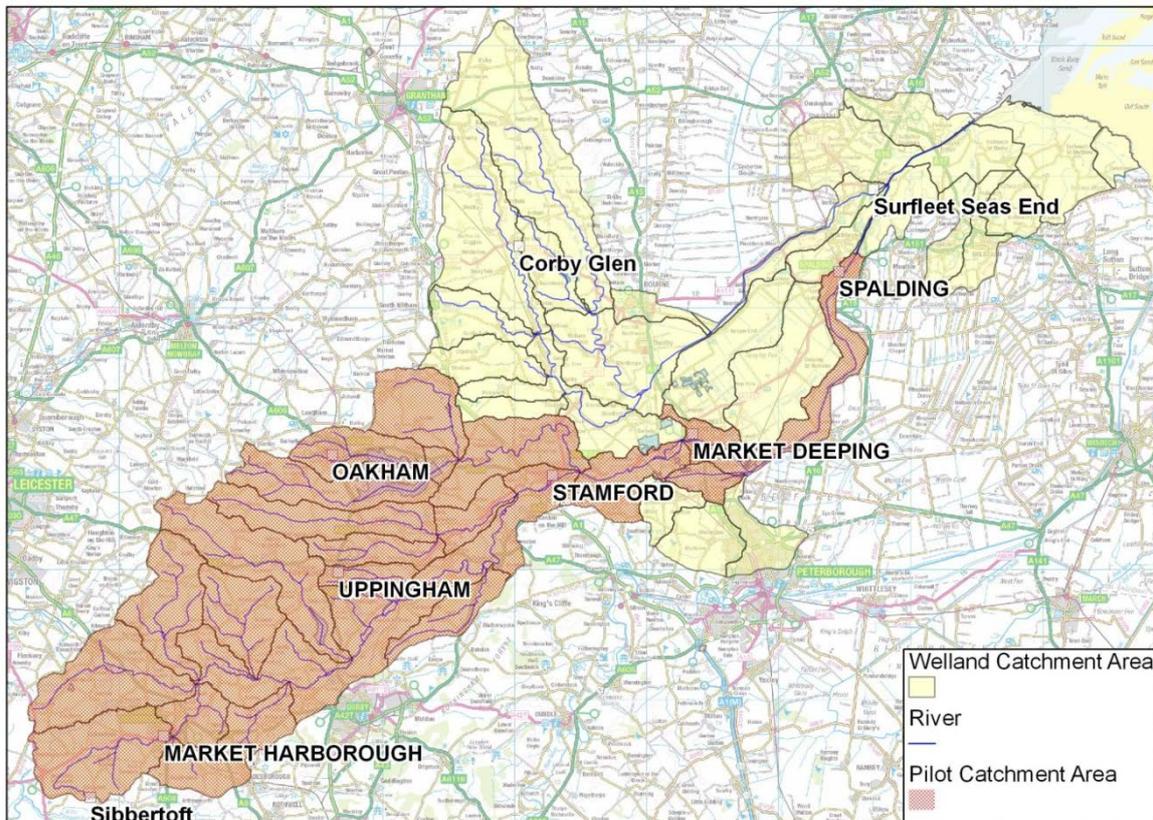


Figure 9: The extent of the Welland Valley catchment (shaded yellow) and the original pilot boundary (shaded red)
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What we want to achieve

Through the actions of the Partnership we want to achieve the following specific goals:

- Provide a clear understanding of the challenges affecting the Welland
- Enthuse local communities, groups, businesses and organisations to enjoy and understand their River and environment and involve them in decision-making and activities
- Work out priorities for improvement – what needs doing, where and in what order
- Deliver these improvements in a joined-up and cost effective way
- Monitor the things we do to ensure they work effectively to improve the River and its resources
- Share information, evidence and ideas
- Demonstrate and test innovative ways to resolve challenges

There are many ways in which we can deliver:

- Obtain involvement from as wide a range of people and interests as possible to develop and agree mutually beneficial plans to improve the River
- Promote greater awareness of the vast network of interlinked watercourses within the Welland Valley and how actions upstream have impacts downstream
- Encourage everyone whose actions affect water to think about how they can change their practices to minimise damage and maximise benefits

- Provide information and advice using good practice from within the Welland Valley and beyond
- Identify priority actions and help target them to those parts of the Valley where they will bring the greatest benefit most quickly
- Record the actions taken to improve the River and monitor how these help to protect and enhance it
- Seek funds from all possible sources to ensure that good ideas can be implemented
- Help organisations work together to make best use of scarce funds
- Seek regular feedback on how we are doing and review and adjust our work accordingly

We will continue to make further progress in 2013 and beyond, building on the foundation provided by the creation of the Welland Valley Partnership, the publication of this River Improvement Plan and our current projects.

Working with others

We recognise that we will only achieve our vision by working in partnership with local communities, groups, businesses, organisations, authorities and individuals. By working together we can achieve more cost-effective improvements for the Welland Valley, encourage others to do the same and help people to understand, enjoy and engage with their local environment.

We need your help to:

- Build up information about the River Welland and its tributaries
- Build up a picture of existing or planned water related projects and events in the Welland Valley
- Develop and share good practice and consistent advice
- Capture ideas and aspirations for the Welland Valley
- Engage, enthuse and work with local communities, groups, businesses and organisations
- Provide practical help, whether financial or in kind, to support investment to enhance the River

Everybody has significant but different roles to play to protect and improve the health of the River. In this document we will set out ideas and activities that can be applied to everyday life, be it for a householder, farmer, business or recreational user of the River.

How we will improve the River

We believe there are three primary ways of delivering improvement to the River through organisations and individuals. We want to work with and influence others in these ways to deliver positive actions, not only in specific watercourses, but more widely across the whole landscape. The three ways are:

1. Statutory responsibilities

Organisations such as the Environment Agency, Anglian Water, Natural England, Internal Drainage Boards and local authorities, are required to deliver certain environmental standards as part of their work. These can be used as a cost-effective way of bringing about positive changes to the health of the River. The Welland Valley Partnership will work with all the organisations which have a statutory role to ensure their works have a positive impact on the River and seek to influence these to deliver maximum benefits.

The Environment Agency is the environmental regulator responsible for ensuring water quality and availability. It works to prevent pollution, licence activities that affect rivers, and plan for improvements. As the “competent authority” for the Water Framework Directive it has the responsibility for reporting success or failure to meet its requirements through Defra to the EU. It is also responsible for protecting properties from flooding. Combining this duty with its responsibility to improve rivers gives the Environment Agency a great opportunity to deliver for the Water Framework Directive.

Natural England is the government’s advisor on the natural environment. It is responsible for Sites of Special Scientific Interest (SSSIs) and other designated areas including National Nature Reserves within the catchment. It also protects wildlife through enforcing wildlife law and issuing relevant licences.

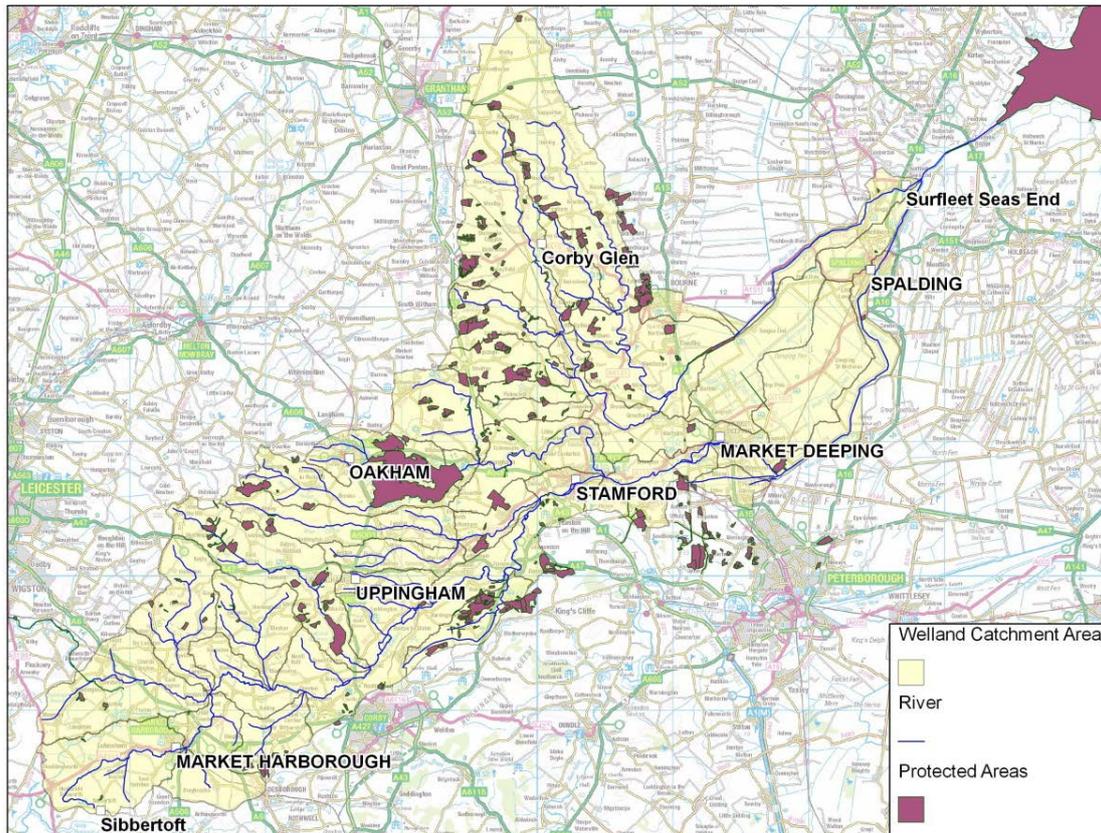


Figure 10: The extent of protected or designated areas in the Welland catchment, including Ramsar sites, SSSIs and nature reserves

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Internal Drainage Boards supervise all matters relating to water level management within their areas (low-lying land in England and Wales) under the Land Drainage Act 1991. Flood risk management is upheld by adhering to national strategies and cooperating with the flood risk management authorities (the Environment Agency and local authorities). The actions of the Boards must also comply with the requirements of more recent legislation such as the Habitats Regulations 1994 and the Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 2005.

2. Projects in action

Many of our partners are already delivering and developing varied projects to improve the health of the Rivers. The Environment Agency has been working to remove weirs that affect water flow and act as a barrier to fish

migration, Anglian Water has implemented customer-based projects aimed at promoting responsible water use, and the South Lincolnshire Fenlands Partnership is working to increase fenland natural habitat. We will work with others to ensure that such projects deliver multiple benefits.

Creation of Lincolnshire Fenland – a project with many benefits

The South Lincolnshire Fenlands Partnership aims to restore and recreate up to 800 hectares of Lincolnshire’s lost wild fenlands between Bourne and Market Deeping. Centred on the Lincolnshire Wildlife Trust nature reserves in Baston and Thurlby Fens, habitat restoration will include areas of wet grasslands for grazing and hay production, reedbeds, swampland, wet woodlands and open water. Working with local landowners, farm tenants, the mineral industry and local communities, the project is seeking to create a sustainably managed landscape in which wildlife and people will thrive.

3. Voluntary actions

These can be undertaken together with activities and projects that are already happening as part of an organisation’s working, or by any individual, community group or business. The Stamford RiverCare group works entirely with volunteers to clean up the Welland in Stamford, and Cummins Generators has donated funds and manpower to deliver a programme of works designed to improve the habitat and flow of the Stamford Mill Stream. Other opportunities for voluntary actions include promoting responsible water use by everyone, and proper maintenance of septic tanks. We can provide advice and expertise to those wishing to set up their own projects and activities, or offer information about action to improve the health of the River.

Landscape working across the whole catchment

The challenges affecting the Welland Valley arise through high nutrient and sediment inputs, low flow at times, and widespread alterations to the natural path and shape of watercourses (hydromorphology). Through changes in land management and land use over the centuries, the River has become disconnected from its historic floodplain in some places, so cannot flood in a natural way. Current approaches to conservation focus on working at a landscape scale and creating networks of well-connected habitats. In his report to the Government in 2010, “Making Space for Nature”¹, Professor Sir John Lawton stressed the need to link wildlife sites;

“There is compelling evidence that England’s collection of wildlife sites are generally too small and too isolated, leading to declines in many of England’s characteristic species. With climate change, the situation is likely to get worse. This is bad news for wildlife but also bad news for us, because the damage to nature also mean our natural environment is less able to provide the many services upon which we depend”.

¹ Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) Making Space for Nature: a review of England’s wildlife sites and ecological network. Report to Defra.

We now have an opportunity to use a landscape-scale approach to protect, maintain and enhance the 'natural capital' of the Valley and the varied 'ecosystem services' which this 'natural capital' provides. We want to see an enhanced network of valuable habitats for wildlife, high-quality food production, reduced flood risk, secure supplies of drinking water, and, not least, a Valley which more people can visit and enjoy in diverse ways.

'Ecosystem Services' and 'Natural Capital'

These terms refer to the wide-ranging services provided by natural ecosystems. They include the provision of clean water and food, climate regulation, crop pollination, recreational experiences and scientific discovery. They are important for everyday life, and we are increasingly becoming aware that they are severely affected by human activity.

The 'Millennium Ecosystem Assessment'² sought to value the services which nature provides to humans from the ecosystems for the whole planet, and through this value, lead to their better conservation or restoration. The 'National Ecosystem Assessment'³ in 2011 was the "first analysis of the UK's natural environment in terms of the benefits it provides to society and our continuing economic prosperity".

We have initially focused on specific priority areas and target issues, with practical work being carried out in the River channel and on adjacent land. We have made good progress so far, with much more planned for the future. In order to fully restore the health of all the watercourses in the Valley, and to maintain the improvements we have already made, we are developing a long-term plan at a landscape scale to realise all the opportunities we are now beginning to identify to enhance the Welland Valley.

In developing a longer-term landscape plan for the Welland Valley, we will look for appropriate sources of funding, and seek to influence what is already available to us. For example, there may be some opportunities for river restoration projects, including better linkage of the River with historic flood meadows and studying their role in flood risk management. Promoting the uptake of Higher Level Stewardship schemes on farms across the catchment would also have landscape benefits. Working with all the relevant interests we can prioritise areas where this work will provide the most benefits including flood risk reduction, environmental improvement and social gain. All proposals will need to take into account the interests of other land and water users in the catchment. The aim will be to proceed with support from our stakeholders at all times.

² Millennium Ecosystem Assessment (2005)

³ UK National Ecosystem Assessment (2011) The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge.

3. Our River Improvement Plan

Getting started

In April 2012 we produced our draft River Improvement Plan. We were able to clearly identify the challenges facing the Welland Valley, and started to determine what needs to be done to tackle them and engage more people with our work. The draft Plan provided us with an excellent foundation to build upon.

We have asked members of the public for their feedback on our work so far. The responses have told us that people want to see more wildlife along the Rivers, less litter and more opportunities to become involved with the River through education and volunteering activities. We have approached Parish Councils, businesses, landowners and farmers to ask them to become involved with aspects of our work. We will continue to listen to the feedback we receive from all interest groups and to develop a fully inclusive work plan.

How we can improve the Welland Valley

Many investigations have been carried out in the past to determine the impacts on the Rivers in the Welland Valley and to suggest ways for mitigating them. These have been vital in understanding what needs to be done to improve them and who will undertake the work.

The following pages give more details about the specific issues facing the Welland – water quality, habitat quality, water resources and improving the river for people and wildlife. We set out what is being done already to solve the problems and what we have planned for the future. Our actions – current, planned and aspirational, are listed in our Action Plan from page 33.

This document is only the first step to enhance the health of the Welland Valley. We will continue throughout 2013 and beyond to ensure that actions are happening across the whole of the catchment, engage more people and organisations to help us with our work, and monitor our current projects to ensure they are bringing about positive change to the River.

Please contact the Project Officer via the Welland Rivers Trust website if you would like to be involved in contributing to our action plan by adding your own projects, providing ideas for new initiatives, or getting involved with our current activities.

3.1 Improving water quality

We know that sediment, nutrients and pesticides are having a severe impact on water quality in the Welland Valley. All living organisms can be affected, from mammals and fish down to plants and microorganisms. Some of these are assessed and indicate if the watercourse has 'Good Ecological Status'. More information about each of these indicators can be found in Appendix 5. Water entering the rivers affected by run-off from fields, roads, developed land or septic tanks is known as diffuse pollution. The sources of pollution are spread across the Welland Valley landscape, so can be hard to determine, and initiatives to reduce their impacts need to cover land away from the River bank as well as next to it.



Figure 11: View of the Eye Brook catchment where the GWCT Loddington research farm is located and typical farming landscape in England. Many new farming techniques to reduce diffuse pollution are developed and demonstrated here (GWCT)

Phosphate

Phosphate is a chemical nutrient essential for plant growth, but elevated phosphate levels can cause excessive plant growth leading to rivers being overrun by weeds and algae. This slows down water flow and reduces dissolved oxygen in the water so the river is unable to support water organisms. Sources of phosphate include farmland run-off and domestic wastewater from septic tanks and sewage works. Phosphate can significantly affect the ecological health of the watercourses, yet is 'invisible' to the eye and difficult to reduce.

Sediment

Sediment is the term used for small particles of soil and other material that enter the water. Sources include run-off from roads, eroding river banks, soil that is washed over the land after heavy rainfall, and livestock trampling river banks. Sediment clogs up river gravels, reducing invertebrate habitat, fish spawning sites and the viability of fish eggs. It also increases flood risk by clogging water courses, and reduces the water storage capacity of reservoirs.

Once in the water, the fine sediments are very hard to remove. As they settle on the river bed, they may release chemicals (e.g. phosphate and pesticides from farming, or oil from roads) into the water over many years. New techniques are being developed in the catchment to reduce the amount of sediment reaching the river. We are also using walkover surveys to find out which sites are most affected. Anglers and walkers can provide this valuable information to us.

Pesticides

Pesticides can have extremely detrimental impacts on the health of the river, terrestrial species and human health. Drinking water standards also have very low tolerance limits for pesticides and parts of the Welland lie within a defined Drinking Water Safeguard Zone. It is vital to ensure that pesticides are targeted effectively on pests and diseases and that their levels in drinking water and the wider environment are minimised.

One pesticide of current concern is metaldehyde. This is used in slug pellets and cannot readily be removed when treating drinking water. Alternatives are available, but may pose different risks to the environment. Cypermethrin, an insecticide used in sheep dip and arable crop insecticides is also a cause for concern. It is toxic to invertebrates and may be one factor in the decline of freshwater shrimps. Their numbers within the Welland have been found to be very low, in turn having an impact on fish populations.

Groundwater

It is not only surface water within rivers and lakes that can be affected by pollution. Groundwater, from which we can take a proportion of our drinking water and which also maintains important wetland sites, is also at risk from pollution sources that affect water quality. The Helpston Groundwater Remediation Project protects the Welland from pollution from a series of historic landfills near to the village of Helpston north of Peterborough. The project creates a hydraulic barrier in the groundwater, holding back pollution from landfill activity which includes mecoprop, a broadleaf herbicide. This allows for the continued abstraction of water from the Lincolnshire Limestone Aquifer for drinking water and for the groundwater to supply the River through springs without causing significant pollution to the River.

Tackling all sources of pollution

Other important contributors to water pollution in the catchment include:

- **Chemicals** such as disinfectants, medicines, and paints, can poison water organisms and the bacteria which break down wastewater in sewage works and septic tanks
- **Decomposing organic matter** removes oxygen from the water and makes it difficult for fish to survive, especially when temperatures are high and water flows are low
- **Fats, oils and grease (FOG)** can block pipes, cause smells and lead to flooding
- **Unflushables** e.g. wet wipes, disposable nappies and cotton buds. These should not be flushed down the toilet as they cause blockages in pipes that can result in pollution and flooding in people's homes

Protecting our drinking water

The River Welland is an important source of drinking water and industrial water supply. Water from the Welland is pumped from Tinwell near Stamford to Rutland Water. Rutland Water, the largest man made reservoir in England, was constructed in the 1970s by Anglian Water to provide more drinking water, and has also become renowned as a recreational resource for bird watching, fishing, water sports, walking and cycling. The Water Framework Directive requires us to identify areas where there is a risk of failing drinking water standards or where water companies need to invest in water treatment to ensure compliance. The Welland above Stamford and Rutland Water has been identified as one of these areas. The Environment Agency is currently developing its 'Safeguard Zone Action Plan for the River Welland and Rutland Water Drinking Water Protected Area' to address water quality issues. This will inform our own activities within the Partnership to protect our drinking water.



*Figure 12: Tinwell Pumping Station is used to pump water from the Welland near Stamford to Rutland Water
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Working through the Welland Valley Partnership

The Resource Protection Group was formed in October 2011 to 'review diffuse pollution in the catchment and recommend areas, communities and issues to tackle'. More information about the Group can be found in Appendix 4. The Group is focusing attention on pollution arising from the following sources:

- Run-off from arable fields, grassland, farm tracks and farmyards
- Pesticides used in agriculture
- Discharges to watercourses from surface water drains serving highways, homes and industrial estates
- Run-off from soakaways serving septic tanks

The group has been tackling diffuse pollution through several initiatives, with more being developed for the future. So far these include:

- Implementing a scheme to provide Partnership grants (up to 50% of total costs, including labour) for investments on farms to tackle diffuse pollution
- Providing advice and a series of workshops for farmers and landowners to promote good practice in land and water management
- Encouraging the owners of septic tanks to ensure that these are properly maintained and do not cause unintended pollution
- Encouraging households to switch to phosphate-free detergents for washing clothes and in automatic dishwashers
- Raising awareness among land managers, land agents, agronomists and other advisers of the Partnership's work and the support which it can provide

Good progress has already been made in engaging land managers with our work. We are also starting to promote our 'Septic Tank Action Plan' to householders (in particular via Parish Councils) and have plans to engage many more individuals and organisations in our work. Full details of our work programme and current activities can be found on the Resource Protection Group's web pages at www.wellandrivertrust.org.uk.

“The Welland Valley Partnership is about improving the River Welland. Farmers can play their part in this, along with others. The Welland Valley Partnership has obtained free advice, training and grants for farmers which will help them to do this.”

Paul Tame, Regional Environment and Land Use Advisor, NFU East Midlands Region

Working with farmers

We are offering on-farm advice on several aspects of the farmed environment which directly affect the catchment, including soils management, Manure and Nutrient Management Plans, Nitrate Vulnerable Zones and Environmental Stewardship (both Entry Level and Higher Level schemes). Advice is also provided on the eligibility of practical capital works for Partnership support.

The Resource Protection Group has developed a programme of workshops. We delivered our first Nutrient Management Planning workshop in November 2012. Future workshops will focus on Soil Management (January 2013), Fertiliser Spinners (March 2013) and Slug Pellets (autumn 2013).

Water Friendly Farming

The Game and Wildlife Conservation Trust Allerton Project and research partners at its Loddington farm are developing and testing methods to reduce the impact of diffuse pollution from farming practice. Through the Water Friendly Farming project, these methods are being applied at a landscape scale, based on three headwater catchments, covering nearly 30km², to determine their effectiveness. They could then be applied across the UK, if successful. Freshwater habitat is being created and resource protection measures are being implemented.



Figure 13: Rural 'brown water' in the Eye Brook – a sign of diffuse pollution (GWCT)

Environmental Stewardship

Natural England has been promoting the benefits of farms joining either the Entry Level (ELS) or Higher Level (HLS) Stewardship schemes. All farms are eligible to join ELS whilst funding for HLS is discretionary and involves more complex environmental management. Both schemes contain 'resource protection' options to protect soil and water resources. There are mutual benefits to both the farmers who partake in the schemes and our aims of improving water quality.

Projects can be developed on farms to introduce methods to reduce the amounts of phosphate, sediment and pesticides entering watercourses, creating and managing better habitats within and around the River and other measures that can improve water quality. We will continue to work with Natural England to ensure that farms in our priority areas are targeted to encourage participation in the schemes.



Figure 14: A farmer building an otter holt next to the River Gwash. The work was funded under HLS which is also funding conservation management of waterside grassland nearby and preventing run-off (Natural England)



Figure 15: This area next to the Stonton Brook is prone to flooding causing soil, nutrient and chemical loss. These losses have been greatly curtailed following waterside grassland creation under HLS (Natural England)

Septic tanks

There are several thousand septic tanks in the Welland Valley and their collective impact on water quality is substantial. Local research has shown that there may be ten times as much phosphorus in discharges from septic tanks compared with arable field drains and that soakaways do not always work well on clay soils. The Resource Protection Group is asking everyone with a septic tank or package treatment plant to help improve water quality by adopting the good practices set out in our 10-point Action Plan. The Group is promoting the Action Plan through Parish Councils, and by attending events and directly contacting households.

Our 10-point Action Plan for Septic Tanks

1. Get to know your septic tank
2. Find out how your tank works
3. Check all parts of your septic tank system regularly
4. Have your tank desludged and serviced regularly
5. Use products which will keep your tank bacteria healthy (e.g. using low-phosphate detergents)
6. Avoid actions which will damage your tank bacteria (e.g. avoid using bleach or disinfectants)
7. Look out for any problems and act promptly
8. Make your tank fit for the future (e.g. renewing or replacing it)
9. Keep good records for your septic tank
10. Seek advice if you have any questions or problems

For full details, download the Action Plan from the Resource Protection Group's web pages at www.wellandrivertrust.org.uk.

Sewage treatment works

As shown below, sewage treatment works are widespread across the Welland Valley. The River Welland and many of its tributaries actually rise at sewage treatment works. Anglian Water has been carrying out investigations in five river catchments over the last two years, including the River Welland. A detailed time series model was built for the catchment which was used to assess the impact of sewage treatment works on phosphate levels. The results of the model are now being analysed. If investment is required to reduce the discharge of phosphorus this will be added to the investment plans. Anglian Water has also allowed us to assess the land around their sewage treatment works so that activities can be developed that will further reduce pollutants entering the water. One other initiative under development is a community-led campaign to encourage residents to use low-phosphate laundry and dishwasher detergents. The aim would be to help reduce the levels of phosphate in treated wastewater from small rural sewage treatment works.

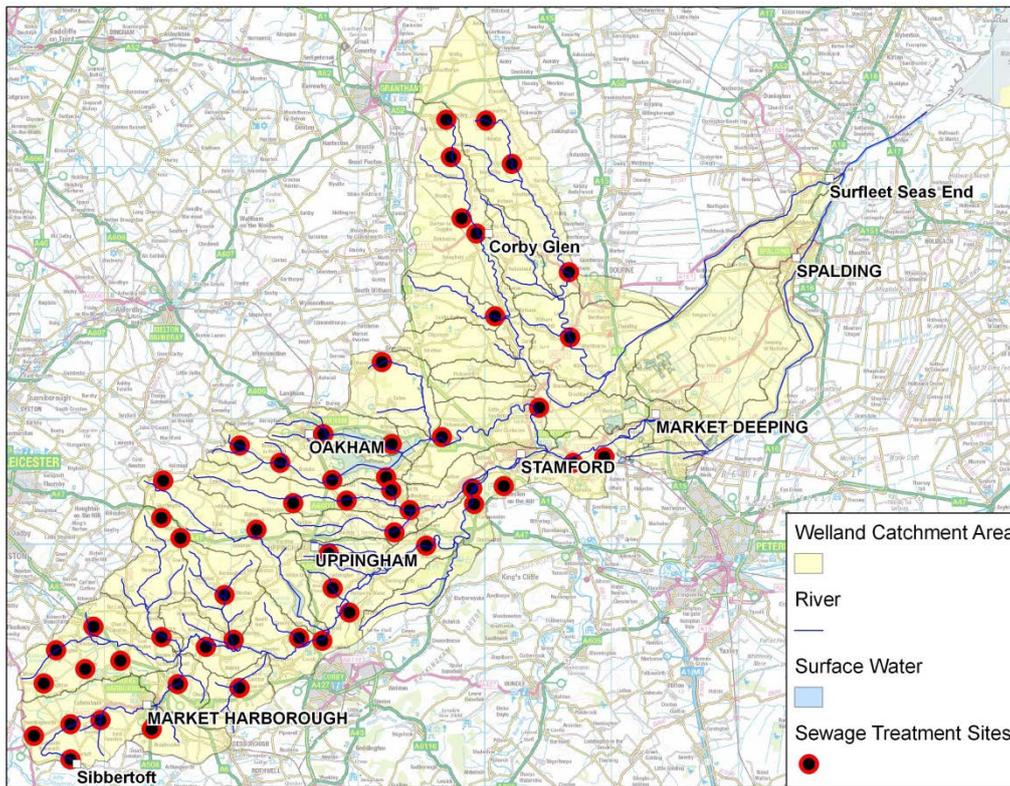


Figure 16: Location of sewage treatment works along the River Welland and its tributaries. Many watercourses start where there is a sewage treatment works

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The future

We will continue to give consistent and clear advice to the Welland Valley farming community, through the development of workshops and visits to the farms from trained advisors. In conjunction with the Game and Wildlife Conservation Trust, we will continue to support the development of new and innovative techniques to reduce the impacts of phosphate, sediment and pesticides. We want to continue to survey the River and its tributaries for problem areas and to tackle them accordingly.

We will promote our aims through this Plan and other methods that have been developed to target specific problems including septic tank maintenance and the use of household products that contain high levels of phosphates. We will continue to recruit new partners to help us spread our message.

The problems facing the River and the methods that can be used to improve its health are all linked. We will work with the Habitats Group and Water Resources Group to develop joint projects and initiatives that will deliver multiple benefits.

What you can do to help

- **Farmers:** contact us for more information about Environmental Stewardship and capital works, attend one of our workshops or arrange a farm visit
- **Parish Councils:** support our work to encourage local communities to use water responsibly and consider what they put into the water
- **If you have a septic tank:** implement our 10-point Action Plan for septic tanks
- **Householders:** use washing powders and dishwasher tablets with low levels of phosphate
- **Businesses:** support river clean-up days, check your surface water drains do not put a nearby watercourse at risk, or sponsor a fish pass to help fish migrate freely
- **Everyone:** contact us if you see any evidence of water pollution (very muddy water, dirty discharges from pipes or drains), support our river clean-up days, or contact us with your ideas for practical actions to enhance the River

3.2 Improving habitat quality

As a result of heavy dredging and straightening programmes over many decades, the Welland above Stamford is in many places too wide, too straight and too deep to function as a healthy river. In some areas, the riverbed is up to three metres below its natural level. These modifications were completed to reduce flood risk to the adjoining land, and in some areas, to drain the land for agriculture. To the east of Stamford, the Welland flows in manmade embanked channels, often at a significantly higher level than the surrounding land. Significant in-channel structures along the Welland, both in size and number, include weirs, sluices and flood defences. These segregate channel lengths and prevent fish migration.



Figure 17: Weir on the River Welland
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Modifications to the river channel can lead to changes in natural processes. Increased amounts of water running into the river can affect water quality through higher phosphate, sediment and chemical pollutants. Resulting increases in weed growth, and a decrease of oxygen dissolved in the water, damages invertebrates, fish and other wildlife.

Sea Trout to Stamford Project

The Environment Agency, Wild Trout Trust and Welland Rivers Trust are working to restore a route for fish migration on the Welland from its tidal outfall at Spalding up to Stamford, and to improve habitats for fish. The project involves the removal of redundant weirs, installation of fish passes and in-channel habitat improvements. These efforts, coupled with our activities to reduce diffuse pollution, will have a positive effect not only on sea trout, but also on a range of fish species.

Many investigations have shown that habitat type, and invertebrate and fish diversity, are seriously depleted. In 2010, a fish survey at Ashley on the Welland found only two trout. There are two main reasons for the low numbers of fish and other wildlife in the Welland and its tributaries.

- River channel modifications have removed the natural habitat features that are vital for wildlife including riffles, pools and meanders.

- The changing flow pattern with high flows becoming higher and low flows becoming lower means that high rainfall events damage the river bed and banks, so when the water levels reduce the water is too low and sluggish to provide suitable conditions for fish.

There are two major reservoirs in the Welland Valley that support wildlife, but will need continued monitoring to ensure that the rivers flowing into them and run-off from the land do not cause damage. Rutland Water, owned by Anglian Water, is a designated SSSI (Site of Special Scientific Interest), SPA (Special Protection Area) and Ramsar Site because of the numbers of wintering wildfowl it supports. It also sustains vast numbers of waders on migration, requiring healthy invertebrate populations. It is known for its nature reserve, run in partnership by the Leicestershire and Rutland Wildlife Trust and Anglian Water, covering the whole western end of the reservoir and maintaining diverse habitats such as reedbeds, wildflower meadows and ancient woodland. Anglian Water has recently completed a three-year project to construct a series of new lagoons with varying water levels to further extend its valuable habitats. The reservoir is also a recreational fishery, and while the reservoir is stocked regularly with trout, coarse fish species are also thriving. The nearby Eyebrook Reservoir is also a SSSI and is an important recreational fishery which supports excellent numbers of birds. Seaton Meadows SSSI near the Harringworth Viaduct is one of the few remaining examples of unimproved alluvial flood meadows in Leicestershire. This habitat has become scarce as a result of river improvement schemes and changes in land management.

Working through the Welland Valley Partnership

The Habitats Group was formed to investigate the issues relating to degraded habitats, the effects these have on the health of the river in terms of its ecology and what can be done to address them. A work plan has been created that has planned projects up to 2015 with the involvement of all members of the Group to ensure maximum benefits not only for habitat improvements, but also to tackle the effects of diffuse pollution.

In-river habitat restoration

The Group will seek to implement actions to restore natural habitats and flows. A prioritised approach has been developed as a result of walkover surveys by the Environment Agency, Welland Rivers Trust and Wild Trout Trust to implement small habitat works to increase the number of natural river features. In 2011, projects were completed at Drayton, Slawston, South Luffenham and Sutton Bassett, with further projects underway in December 2012 at Ashley, Gretton and Harringworth. The University of Leicester has been monitoring resulting changes in habitat types and invertebrate diversity; this will also help to ensure that the features installed are at the optimum location within the River.

The Welland Rivers Trust and University of Leicester are currently embarking on a three-year project – ‘Welland for People and Wildlife’. This will restore the natural habitats of a low-flow channel within a 2km section of the Welland through Market Harborough. The Stamford Mill Stream Project is working to restore an historic section of the Mill Stream by clearing the debris from the channel and creating a new circular footpath route along the canal and across the Welland floodplain.

Habitat Enhancement Projects

The Welland Valley Partnership, in conjunction with landowners, is developing a series of projects on the middle Welland. The work programme includes fencing off the river to prevent livestock eroding the banks, installing cattle drinkers to allow access for drinking and in-channel habitat enhancements that will improve not only habitat quality for fish and other wildlife, but have a positive impact on the speed and direction of flow within the channel.

A demonstration project has already been completed at Drayton, with more in progress at Gretton and Harringworth, near the viaduct. We are checking that these projects deliver positive benefits to inform similar work elsewhere. The University of Leicester is working with the partners to undertake before and after surveys for habitat types and invertebrate species. The University will use the results to test a model developed earlier in the Welland that can be applied to other projects to show where work should be carried out to complement the natural river processes.



Figure 18: Cattle drinker (H. Bunker/EA)



Figure 19: Woody debris deflectors and coir in the channel (H. Bunker/EA)

Barrier removal

The removal of barriers, or installing routes around them, is an expensive but necessary activity to enable fish to migrate along the Welland. In conjunction with the in-river habitat works, this can greatly improve habitat quality and water flows. A programme of weir removal and fish pass installation has already been taking place, with more sites prioritised for 2013 including Borderville Weir on the River Gwash. Here, a redundant weir will be removed, and natural meanders that were cut off from the main channel will be reconnected.

Some of the barriers on the Welland provide flood defences that reduce the risk to people, properties and infrastructure. When planning and delivering habitat enhancements works that involve the removal of barriers, we will ensure that these maintain flood defence and land drainage functions.

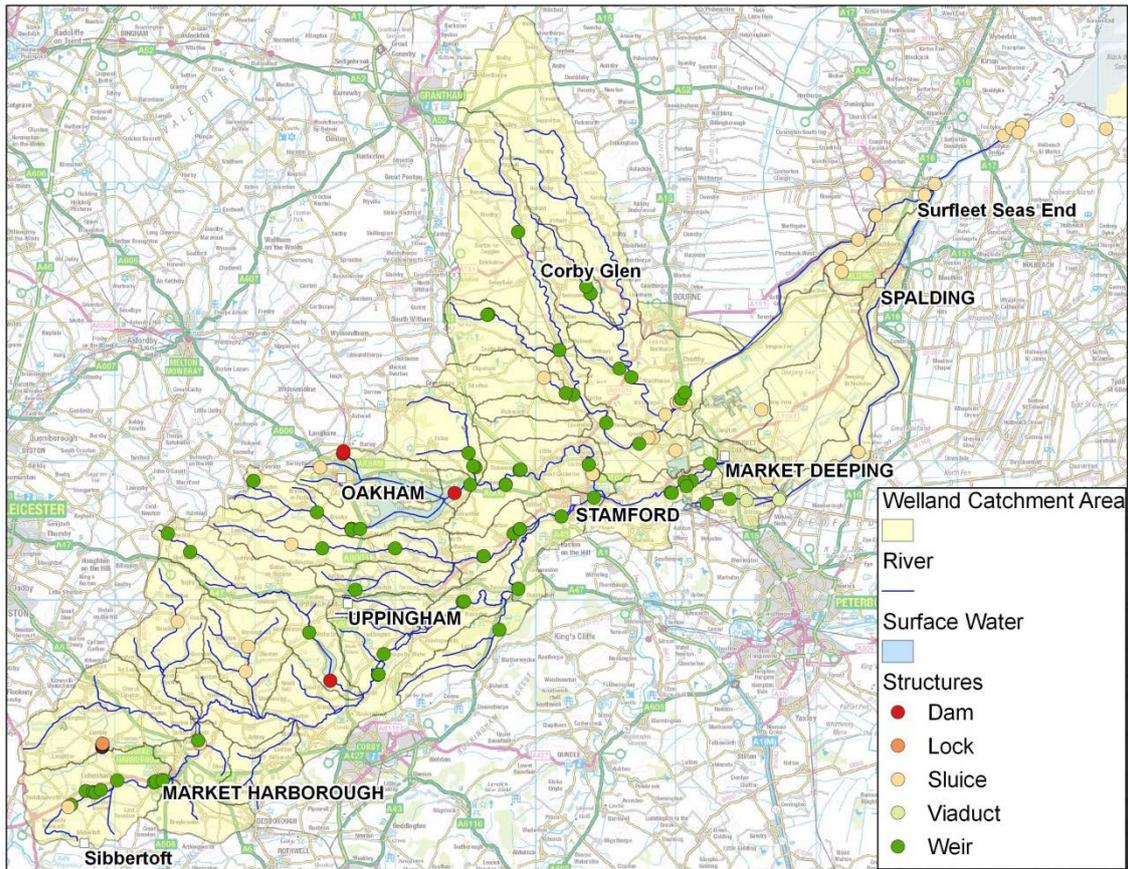


Figure 20: The locations and types of barriers along the Welland and its tributaries
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Out-of-channel habitat opportunities

While the in-channel habitat works and barrier removal are vital to increase healthy habitats and wildlife within the River, it is vital that actions are taken across the whole landscape, particularly the floodplain. This will help to ensure that important wildlife sites, including Rutland Water, Eyebrook Reservoir and Seaton Meadows, remain in good condition and help those that are struggling.

The Habitats Group has commissioned a ‘Habitat Opportunities Mapping’ project to identify current projects across the Welland Valley, aspirational projects and potential partners to deliver projects. These will not only enable the proposer to achieve their own environmental outcomes, but also link these opportunities to improve habitat quality and flow within the River. With this map, we will be able to prioritise habitat opportunities where multiple partners could be involved, and where projects are most feasible. We know that such projects will also reduce the impact of diffuse pollution on the rivers and the landscape. The initial results of the mapping exercise can be seen in Appendix 3, and the Group is now following up these opportunities.

The future

The Habitats Group has created its action plan with projects and activities set to continue until 2015. It will continue its programme of in-channel works and look for funding to establish these projects in as many locations as possible, according to its priorities. The development of the Habitat Opportunities Mapping project will enable us to start activities across the Welland Valley to improve habitat quality, wildlife and water

flow, and to reduce diffuse pollution, working with other organisations and individuals. All of our projects will take full account of other interests, including those of land management, and be developed in close consultation with local landowners and communities.

We want to continue to work with local communities, farmers and businesses to raise awareness of the river and its wildlife, and to encourage people to take an active role in looking after the River. We are already doing this as part of the 'Welland for People and Wildlife' project at Market Harborough, through the development of volunteers undertaking kingfisher and otter surveys, and through river education days for schools. The Welland Rivers Trust plans to hold a 'Bioblitz' event in Market Harborough in spring 2013.

We also want to continue engaging angling clubs and fisheries to implement further actions to increase fish stocks, and to promote our habitat schemes with farmers and businesses.

What you can do to help

- **Farmers:** contact us to see if we can fence off the river and install cattle drinkers
- **Businesses:** can you provide sponsorship, in cash or in kind, for any of our projects?
- **Anglers:** please let us know the state of the river banks and report your fish sightings
- **Everyone:** tell us about your wildlife sightings – mammals, birds, fish, insects or plants

3.3 Improving water resources

Water is a key element for life, and both surface and ground water provide a crucial resource for people and the natural environment. The quantity and dynamics of water flow and water levels are also important to support all the flora and fauna that live in and around watercourses.

The Environment Agency is responsible for managing water resources to ensure that there is enough water available for people and businesses while protecting the needs of the natural environment. The Environment Agency knows where water is available in the Welland and where current rates of abstraction need to be reduced where appropriate. Monitoring the ecology of the river, especially at times of low river flow, allows the Environment Agency to work with licence holders to reduce their potential impact on the environment. Three stretches of the Welland and its tributaries have been identified as receiving insufficient flow to support their in-river ecology; the Gwash, Eye Brook and the Welland upstream of Market Harborough.

Rainfall in the Welland Valley varies greatly, ranging from 525mm to 750mm per year, and is expected to become even more unpredictable in the future due to climate change. Rivers respond to rainfall by an increase in water levels and flow, and those which respond quickly are termed 'flashy'. These have more ability to erode, transport and deliver sediment from the land to the river which can cause severe ecological damage. In summer, low flows and dry soils can mean that after sudden heavy rainfall, the short-term flow in the River can increase dramatically, along with the amount of sediment that is deposited. The majority of rivers and streams in the Welland Valley are moderately flashy because of its clay catchment, so will be affected by the changing levels in flow associated with heavy rainfall.

Abstraction

This is the process where water is taken, temporarily or permanently, from surface water or groundwater for a number of uses including industry, irrigation or for drinking water. Above a defined threshold, the amount that can be abstracted is controlled by the Environment Agency using an abstraction licence.

There are many factors which affect the volume of water in the Welland Valley including:

- Abstraction of the water from the main Welland near Stamford which is pumped into Rutland Water Reservoir to provide drinking water
- Sewage treatment works putting water back into the rivers after being processed
- Agricultural abstraction for crops such as potatoes

Water quantity and flows are an issue for the Welland and for its tributaries in many ways:

- Distribution of rainfall throughout the year can influence sediment transported into the river. Even in summer, heavy rainfall causes sediment to run from hard, dry land into the Welland
- Sections of the Welland have been known to flood property and surrounding land. The Maxey Cut, a large flood relief channel at Maxey on the lower Welland, protects Market Deeping from flooding while the Coronation Channel protects Spalding. These relief channels provide flood protection, but can also exacerbate low flow conditions and ecological damage in the permanent river channel if they are not managed properly
- Water resources during dry months can be scarce and low flow conditions correspond with high water temperatures and low oxygen levels, threatening the survival of fish, invertebrates, algae and macrophytes

- Low flows and water levels can affect water supply leading to restrictions on people and businesses. Household­ers will commonly notice this when a hosepipe ban is enforced. Provision of water for livestock from rivers may also be compromised
- As water levels drop, rivers often become less attractive and even stagnant, as dissolved oxygen levels fall. An attractive river is an important recreational resource
- Treated water from sewage treatment works plays an important role in supporting river flows, which is of great importance during the dryer summer months. The treated water is of a quality consistent with Environment Agency and Anglian Water guidelines; nonetheless there remains a degree of pollutants which can be significant in these times of decreased flow

Find out how much water is in your local river

Information about water levels for the rivers within the Welland Valley can be checked via the Environment Agency at <http://www.environment-agency.gov.uk/homeandleisure/floods/riverlevels/120733.aspx>. You can find out where the water levels are monitored, and information on typical levels, current levels and recent flood events.

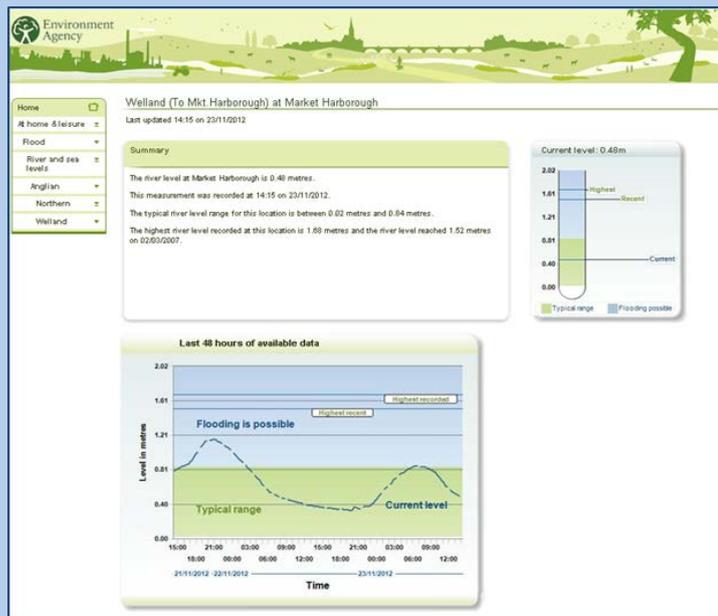


Figure 21: 'Screen-grab' of the EA's webpage showing river levels along the Welland in Market Harborough

Working through the Welland Valley Partnership

We recognise the need to manage our water and use it sensitively to provide long term protection for wildlife and the environment, whilst also maintaining it as a resource that can support sustainable growth of our communities and businesses.

Water Resources Group

We have established the Water Resources Group to examine the reasons behind water quantity and flow issues and develop actions to improve them. The group includes members from Anglian Water, the Environment Agency, Welland & Deepings Internal Drainage Board and the Welland Rivers Trust. Details of projects and activities relating to specific water resources issues will be published on the Welland Rivers Trust website as they develop.

Promoting responsible water use

Anglian Water has been proactively raising awareness of domestic and business customers of the need to save water for many years and has worked to reduce leakage from pipes. The 'Love Every Drop' campaign launched in 2010 aims to change people's attitudes to using water and put it at the heart of sustainable living, to help preserve water supplies for the future. Anglian Water has also launched 'Drop 20', an initiative which aims to deliver a reduction in average personal water use from 145 litres to 125 litres per day. It is also promoting the use of household metering, with 70% of households in the region already having metered supplies.

Improving flow along the river

The Gwash Flows Project, an initiative involving the Environment Agency, Wild Trout Trust and Anglian Water seeks to make the best use of water released from Rutland Water throughout the year under a statutory compensation scheme. Additional releases are made when the Environment Agency operate their Gwash to Glen Transfer Scheme. The project aims to ensure that the extra water that is released to the Gwash achieves the most environmental benefit. The project is at a trial development phase and rigorous monitoring will be required to ensure that any proposal delivers the projected benefits.

The future

We will continue to work with others to show how our actions can affect water levels, particularly in the context of recent floods, droughts and continuing climate change. We aim to demonstrate how small changes in our water usage can make a real difference to the River and its tributaries.

Through the Water Resources Group, we will draw on existing knowledge within the Partnership, and engage others who can help promote greater awareness. We will develop a work programme that will:

- Review at water resource and flow issues and implement projects to address them
- Create an improved evidence base through data collection and investigations to inform our actions
- Promote good practice and offer advice to others
- Continue to collect ideas and aspirations from others
- Take into consideration the changing climate and adapt our work programme according to evidence provided. Appendix 5 provides a recent assessment, by the Environment Agency, of the potential effects of climate change on the Welland Valley

What you can do to help:

- **Everyone:** please use water responsibly – contact us for more information about how minor changes to your everyday routine can make a big difference to the amount of water you use

3.4 Improving the Welland Valley for people and wildlife

In addition to the services that the River provides for households, farming and other business, it also supports a vast array of wildlife and habitats and recreational opportunities including fishing, walking and boating. Some sites within the Welland Valley are internationally important for wildlife, most notably Rutland Water. Many smaller sites are valuable for wildlife and people alike such as Seaton Meadows SSSI, Eyebrook Reservoir and the Lincolnshire Wildlife Trust sites at Baston and Willow Tree Fen along the River Glen, and Deeping Pits along the River Welland. The middle Welland was the first place in England where the Osprey and Red Kite could be seen together thanks to successful reintroductions of both species, and they now breed in the Welland Valley. By improving the Valley for wildlife, we are also improving it as a resource for people to enjoy, through fishing, bird watching, walking or boating. We need to involve local communities in our projects and encourage everyone to become involved in caring for and enjoying their local River.



Figure 22: Osprey pair at Rutland Water's Lyndon Nature Reserve with Burley –on-the- Hill House in the background – a major attraction for visitors to Rutland Water (John Wright/LRWT)

Working through the Welland Valley Partnership

We want to continue to make the Welland Valley a more valuable asset for people and wildlife. The people who wish to use the River will see the benefits of our work through increasing fish populations and a more attractive river to enjoy. We also believe that efforts to improve the health of the Valley should not just be limited to the pilot boundary, but the whole Welland catchment.

Communicating what we do

The Welland Rivers Trust now has Facebook and Twitter pages to engage more people with our work. We are developing a new website to enable everyone to have access to up-to-date information on water quality, wildlife and all of our projects and activities.

The Welland Rivers Trust, with support from the University of Leicester, has collated data from many different sources including the Environment Agency, Wildlife Trusts and others to create maps detailing many aspects of the health of the rivers. The Partnership is going to use these to inform and target our efforts effectively. This information will also be available via the Welland Rivers Trust website for anyone to access. The Habitat Opportunities Map (see Appendix 3), commissioned by the Habitats Group, will show where there are current activities happening within the Welland Valley and aspirational projects that we can become a part of.

‘Welland for People and Wildlife’

In July 2012, the Welland Rivers Trust was successful in its Catchment Restoration Fund bid to receive £500,000 to restore a 2km section of the Welland through Market Harborough, Leicestershire. Over three years, the Trust, in conjunction with the University of Leicester and Market Harborough District Council, will plan and execute a programme of works to improve the habitat and ecology of the river, while maintaining flood defences. We are seeking valuable information from the local community about what they want to see as a result of the project, including safe access, education days and more wildlife. The Trust has held two meetings in the town to let residents know what is being planned, and to seek their inputs. More public meetings will be held as the design takes shape, and events will be run to engage more people with the River. The Environment Agency is also working alongside the project to remove the weirs that stop fish moving along the Welland.



Figure 23: Banner produced by the Welland Rivers Trust

Community involvement

Local communities are already playing a vital role in improving the health of the River. One project, to restore a degraded section of the Mill Stream running through Stamford, has been running since 2010. The Welland Rivers Trust, with support from Cummins Generator Technologies and local residents and businesses, has cleared the rubbish and overgrown weed out of the Mill Stream over many volunteer days, the latest on 8 October in 2012, with over 200 people helping. The next stages of the project are to keep the channel clear and address the low flow issues to improve to improve wildlife habitats, and to provide safe access so the Mill Stream can be enjoyed by all.



Figure 24: Himalayan Balsam (*Impatiens glandulifera*)

Community volunteering has also played a vital role in removing and reducing invasive plant species in the Welland Valley. Himalayan Balsam is a very pretty but very destructive wetland plant introduced to Britain in 1839. It quickly colonised our riverbanks by outcompeting other plant species. It can also contribute to bank erosion and flood risk in the autumn when it dies back. The Stamford RiverCare group run “pulling” sessions each year to remove as much of it as possible and are seeing great results.

RiverCare

The Stamford RiverCare Group is one of nearly 50 groups working to improve their local river environment through a Partnership managed by Keep Britain Tidy and funded by Anglian Water. If you would like to join an existing group, or start a new group, go the RiverCare website for more information.

www.keepbritaintidy.org/Programmes/RiversAndCanals/RiverCare/Default.aspx

Fish and angling

There has been a great deal of concern from anglers and the public about fish stocks within the Welland. Fisheries surveys carried out by the Environment Agency over a number of years have shown a decline, and 13 out of the 33 stretches of the Welland and its tributaries have been identified as failing for fish under the Water Framework Directive. Fish need good water quality and flows, habitats and food supplies to thrive.

Along the Welland:

- Barriers within the river channel, such as weirs, stop fish moving along the whole of the Welland
- Sedimentation prevents fish spawning
- Reduced numbers of freshwater shrimp, a staple food for fish, could be linked to the use of pesticides
- High water temperatures and low flows cause lowered oxygen levels in the River
- Flood events can wash fish downstream

Current work to improve water quality and habitats in the River will help to tackle these problems, but more is being planned by the Resource Protection, Habitats and Water Resources Groups.

Angling clubs, River Bailiffs, walkers, landowners and boaters can provide valuable information to help us improve the number of fish, and other wildlife, in the River. Reporting any problems along the River to the Project Officer will help us to develop measures to improve the River for fish and other wildlife. We are already working with many clubs and individuals, but will always welcome inputs from others.

The future

While much has already been achieved to improve the Welland Valley for people and wildlife, we know there is still much more to do. Projects developed through our Groups will directly further this aim. Other activities that we will develop include:

- Involving local communities, Parish Councils, farmers, landowners, businesses, schools and others in our work and providing advice and information about how best to use water responsibly and improve the health of the River
- Developing projects to target specific wildlife species, that will ultimately have benefits to the general health of the River
- Engaging local communities to find out what they want to see along the River and how they want to enjoy and access it
- Contributing to proposals for developing the navigation of the River in Lincolnshire
- Identifying funding that will ensure our valuable work – all of which costs money – is supported effectively

What you can do to help:

- **Anglers, boaters, walkers and residents:**
 - If you see a fish in distress, such as gasping at the surface, contact the Environment Agency's incident hotline on 0800 80 70 60
 - Tell us if you see any pollution in the River
 - Let us know if you want to be involved in our work (e.g. as a volunteer)
- **Businesses:** can you help fund any of our projects, sponsor a fish pass or provide a work force for river clean up days?
- **Parish Councils:** can you help us to develop a River Warden programme in your area?
- **Everyone:** join or start a RiverCare group

4. Our Action Plan

The following pages set out what we are doing now and what we plan to do to tackle the challenges identified within the Welland Valley and to ensure that, in time, the River reaches Good Ecological Status. Some of the projects listed are aspirational and while we have partners willing to undertake them, more investigation is needed to arrange funding or bring other partners on board to help deliver them.

It is important that we continue to monitor and appraise our projects to ensure that they are having all the positive impacts which we think they will, and to determine if they are producing any added benefits. This action plan will act as our baseline to monitor our progress.

We know that this is not the full picture of activities taking place in the Welland Valley. We will continue to collate information on other initiatives, and to identify partners who we can support (or who can help us) to make improvements. This will help to ensure that activities take place across the whole of the Valley, and that we link partners with other organisations and individuals who can help each other deliver their work.

The issues facing the Welland are all interlinked and we know that projects undertaken to improve water quality will also have positive benefits for habitat quality and vice versa. Many of the projects listed below could be repeated in the two main sections dealing with the Resource Protection and Habitats Groups. Many also involve communicating our work and engaging local communities to deliver additional benefits.

For more information about what is happening within the Welland Valley, or to tell us about something new, please go to the Welland Rivers Trust website (www.wellandriverstrust.org.uk) or contact the Project Officer at info@wellandriverstrust.org.uk.

Partner abbreviations

AT	Angling Trust	WRT	Welland Rivers Trust
AW	Anglian Water	WTT	Wild Trout Trust
BCNWT	Beds, Cambs and Northants Wildlife Trust	WT	Woodland Trust
EA	Environment Agency		
FftF	Fens for the Future Partnership		
GWCT	Game and Wildlife Conservation Trust		
GFC	Gwash Fishing Club		
LWT	Lincolnshire Wildlife Trust		
MFF	Mayfly Fly-Fishers		
MHDC	Market Harborough District Council		
NFU	National Farmers Union		
NE	Natural England		
PC	Pond Conservation		
RC	Stamford RiverCare		
SLF	South Lincolnshire Fens Partnership		
UoL	University of Leicester		
W&DIDB	Welland and Deepings Internal Drainage Board		

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Resource Protection								
Resource Protection Group	Catchment	AW, EA, GWCT, CLBA, NE, NFU, WRT	'Review diffuse pollution in the catchment and recommend areas, communities and issues to tackle'. Take an overview of all projects described below, seeking to draw out and promote good practice and practical actions to tackle diffuse pollution.	On-going	All		Engage land managers and local communities. Secure and sustain beneficial actions. Thereby maintain and/or improve the ecological status of water bodies in the catchment.	Current
Advisory farm visits	Prioritised sub-catchments initially.	GWCT, EA, NFU, farm advisors	Provide targeted visits to advise on reducing diffuse pollution methods; identify opportunities to support projects on farms in priority areas with Partnership grants (see below)	On-going	Phosphate, Fish, Macrophytes, Invertebrates	tbc	Promote Resource Protection messages. Engage local farmers. Improve water and habitat quality.	Current
'Working with Farmers' Partnership grants	Catchment	EA, GWC, NFU, WRT, farm advisors	Support farmers with advice and match funding for actions (e.g. fencing off rivers, roofing yards) to reduce diffuse pollution and improve the river environment.	On-going	Phosphate	£35,000	Implement actions to improve water and habitat quality. Raise awareness among farmers.	Current
Environmental Stewardship	Catchment	NE	Promote Entry Level and Higher Level Stewardship schemes to land managers to encourage changes in the use and management of land to help protect water and soil and to enhance wildlife habitats.	On-going	Phosphate, Fish, Macrophytes, Invertebrates, Diatoms		Implement actions on farms, though funding, to reduce phosphate, sediment and pesticide impacts. Engage local farmers. Improve water quality and habitats.	Current

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Workshop programmes	Catchment	AW, EA, GWCT, NFU	Offer practical advice and promote good practice to farmers through a series of workshops (e.g. use of slug pellets, and managing manure, fertilisers, and soil to minimise diffuse pollution).	2013	Phosphate	£2,000 each	Reduce sediment, phosphate and pesticides entering the water. Improve water and habitat quality	Current
Septic tank awareness	Catchment	AW, EA, GWCT, CLBA, NE, WRT	Promote awareness and good practice in managing septic tanks among householders and businesses, in particular via contact with parish councils, through a 10-point 'Septic tank action plan'.	2013	Phosphate		Reduce risks of pollution from septic tanks. Improve water and habitat quality	Current
P reduction project	Prioritised sub-catchments	AW, EA, WRT	Encourage specific communities to use laundry and dishwasher detergents which contain less phosphate. The targeted catchments are where modifications at the sewage treatment works to remove phosphate chemically would be overly disruptive and costly.	2013	Phosphate		Reduce the levels of phosphate in the targeted catchments. Improve water and habitat quality. Engage local communities in caring for their river.	Current
Tramline management project	Eye Brook	GWCT, ADAS, Lancaster University, Defra	Test methods of tramline management to improve infiltration, reduce run-off and its impact on watercourses, without damaging crop performance	On-going	Phosphate, Fish, Diatoms, Macrophytes, Invertebrates, Dissolved oxygen	Defra	Advice to farmers on improved tramline management to improve water and habitat quality	Current
Water Friendly Farming	Eye Brook and Stonton Brook	GWCT, AW, PC, EA, Syngenta, York Univ., farmers	Test the effectiveness of various diffuse water pollution mitigation measures within a practical farming context. This includes collecting baseline biological data and monitoring pesticides and nutrients in water.	On-going (funding secured to March 2015)	Phosphate, Fish, Macrophytes, Invertebrates	£120,000 from EA, £15,000 from EA, £590,000 from CRF	Reduce diffuse pollution. Improve water and habitat quality	Current

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Pinpoint	Catchment	GWCT, WRT, NE, EA, Rivers Trusts	Locate risks of diffuse pollution, and opportunities to enhance habitats by undertaking walkover surveys. Volunteers have been trained by GWCT and WRT and are being supported by targeted use of consultants. The results will inform the use of advice, workshops, and partnership grants.	2012	Phosphate, Fish, Macrophytes, Invertebrates	£28,000 from NE CSF, £23,000 WRT	Identify problem areas caused by diffuse pollution. Engage local farmers and volunteers. Improve water and habitat quality.	Complete
Love Every Drop	Catchment	AW	Encourage everyone to use water in a sustainable way to protect it as an important resource.	On-going		tbc	Protect drinking water quality. Deliver sustainable water treatment. Engage communities. Improve habitats.	Current
Drinking Water Safeguard Zone	Gwash and Welland	EA	Designate the Welland catchment upstream of Tinwell, the Gwash and other tributaries to Rutland Water as a non-statutory safeguard zone to protect drinking water. Further its aims through the programme of providing information, advice, and workshops. Trial alternatives to metaldehyde.	On-going	Protect drinking water quality		Reduce the levels of phosphate and pesticides entering the water. Improve water and habitat quality	Current
Metaldehyde Stewardship Group	Catchment	AW, NFU, EA, DWI, NE, others	Work with agricultural chemical companies and the Pelletwise campaign to promote good practice in the use of slug pellets and look for effective and safe alternatives to metaldehyde.		Fish, Macrophytes, Invertebrates, Diatoms		Provide advice to farmers. Improve water quality. Develop alternative products.	
Freshwater shrimp project	River Welland	EA	Investigate the lack of freshwater shrimp linked to cypermethrin over 40 sampling sites.	On-going	Fish	£10,000	Increase fish populations and improve water quality	Current

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Habitats								
Habitats Group	Catchment wide	AT, BCNWT, EA, LWT, UoL, WRT, WT	Pursue non-river landscape opportunities to provide a benefit to the aquatic environment through mitigating current flow regimes (e.g. increasing wetlands and woodlands) whilst also providing increased biodiversity. These opportunities are described in a Habitat Opportunities Map.	On-going	All		Improve failing water bodies to meet good ecological status and maintain good ecological status	Current & aspirational
Sea Trout to Stamford project	River Welland	EA, WRT, WTT, landowner	Provide safe fish passage and habitat improvements from the Wash to the Gwash	To 2015	Fish, Hydromorph.	£1.1m	Barrier to fish passage by-passed or removed between the tidal Welland and River Gwash.	Current
Fish passes (Gwash to Market Harborough)	River Welland	EA, UoL, landowner	Construct fish passes at Duddington (2012), Ashley (2013), Hudds Mill, Tinwell, Barrowden, Gretton, Market Harborough (2013)	2012-2015	Fish, Hydromorph.	£2.5m	Free passage of fish along the Welland to restore populations	Current
Preventing fish kills	River Welland	EA, W&DIDB, AW	Undertake scientific investigations at key pumping stations in the catchment to determine the nature of fish kills and develop long term solutions	tbc	Fish	tbc	Reduce the numbers of fish killed at pumping stations	Planned
Fish refuges	River Welland (Deepings to Spalding)	EA, UoL	Undertake studies to determine suitable locations to enhance existing or create additional backwaters and washlands	tbc	Fish	tbc	Improve fish populations by providing suitable habitat	Planned
River corridor habitat enhancement	River Welland u/s of Market Harborough	EA	Implement in-channel habitat improvement works	tbc	Fish, Invertebrates, Macrophytes, Diatoms	tbc	Improve good ecological status indicator populations and water quality	Planned
River corridor habitat enhancement	River Welland Wakerley to Duddington	EA, GFC, landowner	Implement in-channel habitat improvement works	2013-2014	Fish, Invertebrates, Macrophytes, Diatoms	tbc	Improve good ecological status indicator populations and water quality	Planned

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
River corridor habitat enhancements	Harringworth – Gt Bowden Great Bowden Rd Bridge to below Ashley Rd Bridge	EA, UoL, landowner, MFF, GFC, WRT	Implement in-channel habitat improvement works, e.g. channel narrowing, riffles, woody debris, shading, livestock fencing and assess works to provide evidence for the effectiveness of techniques	2012-2015	Fish, Invertebrates, Macrophytes, Diatoms, Phosphate	£352,000	Improve good ecological status indicator populations and water quality	Current
Bridge refurbishment	Welland and Medbourne Brook	EA, Leics County Council Highways	Remove apron on road bridge at Slawston and Medbourne		Fish	tbc	Allow fish passage and restore fish populations along the Welland and Medbourne Brook	Planned
Welland for People and Wildlife	River Welland River Jordan at Market Harborough	EA, MHDC, UoL, WRT	Restore a 2km stretch of the Welland through the town by naturalising the channel and removing weirs with as much community involvement as possible using a communications plan	2012-2015	All	£640,000	Create a more natural river, reach good ecological status, raise awareness of the river amongst the community	Current
River corridor habitat enhancement	River Gwash: Tolethorpe towards Ryhall	EA, GFC,	Implement in-channel habitat improvement works	2013	Fish, Invertebrates, Macrophytes, Diatoms	£9,000	Improve good ecological status indicator populations and water quality	Planned
Fish passage	River Gwash	EA, WRT, WTT	Complete actions listed in the Sea Trout to Stamford plan, including removal of weirs and other barriers	2012-2015	Fish, Hydromorph.	£900,000	Free passage of fish along the Gwash to restore populations	Current
Fish pass	River Glen	EA	Design and implement a fish pass at Surfleet Sluice	tbc	Fish, Hydromorph.	tbc	Free passage of fish along the Glen to restore populations	Planned
Fish passes	River Chater	EA, landowner	Design and implement fish pass at the Fosters Bridge weir and remove Ridlington weir	2013	Fish, Hydromorph.	£200,000	Free passage of fish along the Chater to restore populations	Current
River corridor habitat enhancement	Stonton Book and River Chater	EA, landowner	Design and implement habitat improvement works	2013	Fish, Invertebrates, Macrophytes, Diatoms	tbc	Improve good ecological status indicator populations and water quality	Planned

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
River corridor habitat enhancements	River Welland River Glen Lincs Fens	SLF, LWT, FftF	Improve river and waterside habitat, restore fenland, manage and improve water resources	On-going	Fish, Invertebrates, Macrophytes	£2.3m to date	Improved habitats and water resources	Current
Mill Stream Restoration Project	Stamford Mill Stream	WRT, UoL, AW plus others	Restore a degraded section of the Mill Stream though the town meadows. Clear overgrown sections and maintain, improve water flow by possible installation of pumps at Tinwell weir, create footpath and safe access points. Partners – Cummins, Burghley Estate, Tesco, Wilkinsons, Stamford Mercury, Stamford Living Magazine, Stamford RiverCare, people of Stamford	On-going	Fish, Invertebrates, Macrophytes, Diatoms	£20,000	Restore the natural habitat and water flow though the Mill Stream using a 15 year maintenance plan. Community involvement in caring for the river. An educational resource.	Current
Fish passage	Stonton Brook	EA, landowner	Design and implement a fish pass at the entrance of the brook	2015	Fish, Hydromorph.	tbc	Free passage of fish along Stonton Brook to restore populations	Planned
Fish passage	Langton Brook	EA, landowner	Design and implement a fish pass at the entrance of the brook	2015	Fish, Hydromorph.	tbc	Free passage of fish along Langton Brook	Planned
Survey work	Catchment	EA, WRT, UoL	Increase the number of surveys for fish, macrophytes, invertebrates, diatoms, otter, plants, cormorant, and update the local biodiversity action plans. Partners – parishes, schools, wildlife trusts, local authorities, NE	tbc	Fish, Invertebrates, Macrophytes, Diatoms	tbc	Up to date knowledge of indicator species within the catchment, local community engagement, opportunity to develop new projects	Aspirational
Borderville Weir	River Gwash	WRT, EA, WTT, UoL	Remove a redundant weir, restore two meanders that had been cut off from the main channel and enhance habitats. Monitoring by UoL	2012-2013	All	£24000	Restore natural features, improve habitat and water quality, allow fish migration	Current
Barrowden Mill Pond	River Welland	WRT, Barrowden Parish Council	Restore water quality of the Mill Pond in Barrowden village	tbc	Macrophytes, Invertebrates, Diatoms, Phosphate, Dissolved oxygen	tbc	Reduce algal growth, improve the habitat and water quality, create an attractive feature in the village	Current

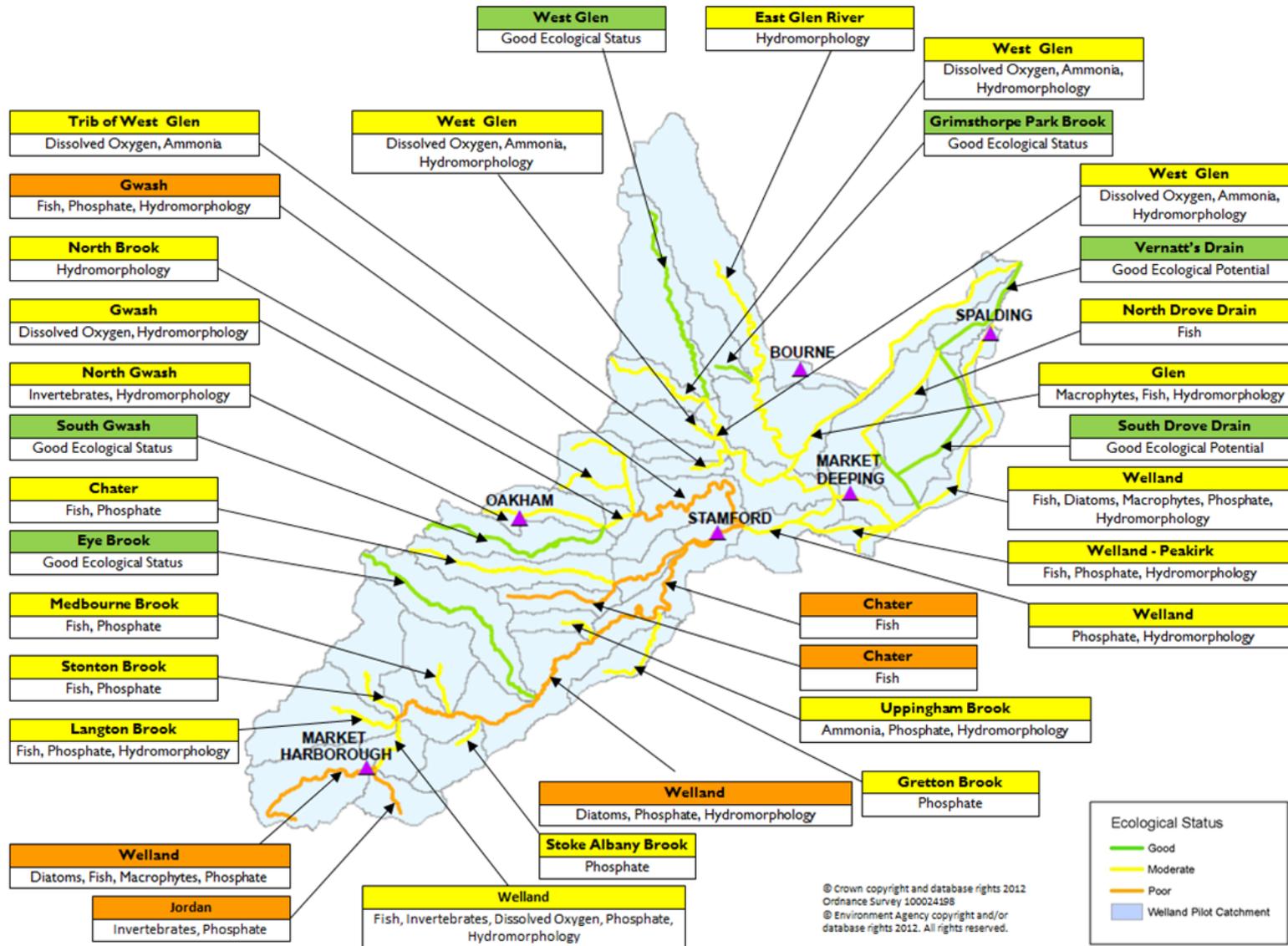
Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Invasive species	River Welland	WRT, EA, RC, W&DIDB	Remove Japanese Knotweed and Himalayan Balsam at Market Harborough (as part of Welland for People and Wildlife Project) and Stamford (by RC and Mill Stream Project), use of chemicals by W&DIDB	On-going	Fish, Macrophytes, Diatoms, Dissolved oxygen, Invertebrates		Improve habitat and water quality, involvement of local communities and volunteers	Current
Habitat improvements	Medbourne Brook	EA, WRT, UoL	Investigate removal of concrete sections in the village and in-channel habitat works	tbc	All	tbc	Improve habitat and water quality, engagement of local community	Aspirational
Keeping Rivers Cool	Catchment	EA	Implement a four-year climate adaptation project focused on using trees to keep rivers cool, undertake river restoration works and investigate modifications of abstraction rates	4 years	Fish, Macrophytes, Diatoms, Dissolved oxygen, Invertebrates	tbc	Reduce river water temperature, improve riparian habitats and improve flow rates	Current
Bridge installation	River Welland	EA	Replace fords known to contribute to sediment and chemicals entering the water	tbc	Fish, Invertebrates, Macrophytes, Dissolved Oxygen, Diatoms, Phosphate	tbc	Improve habitat and water quality, reduce bank erosion	aspirational
Stamford RiverCare	Stamford	RC, AW	Raise the profile of the Welland and improve it as a public amenity, encourage people to look after their river, support maintenance of the river, volunteer activities, working with local organisations	On-going	Fish, Invertebrates, Diatoms, Dissolved oxygen, Macrophytes		Improve habitat and water quality, engage the local community to care for their river	Current
Management of banks and drains	Lincolnshire	W&DIDB	Survey channels before drain maintenance or improvement works. Wildlife regularly recorded includes water vole, owls and frogs, and identify invasive species. Work alongside NE and Lincs Biodiversity Partnership	On-going	Fish, Invertebrates, Macrophytes, Diatoms		Protection and enhancement of existing habitat, implement appropriate management	Current

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Cross Drain SSSI	River Welland at Crowland	W&DIDB	Manage and maintain this SSSI, designated for its beetle population. Create buffer strips along the river, de-silt 500m, maintain water levels for environmental benefit and abstraction	On-going	Fish, Invertebrates, Macrophytes, Dissolved oxygen, Diatoms, Phosphate		Maintain and enhance a SSSI, improve water and habitat quality	Current
Hedge planting	Lincolnshire	W&DIDB	Plant 6.5km of native species hedge and small tree sites		Invertebrates		Creation of wildlife corridors along fenland	Complete
Biodiversity Action Plan	Lincolnshire	W&DIDB	Produce an annual BAP to identify habitats and species of national and local importance	On-going			Appropriate management and enhancement of water bodies to improve wildlife and water quality	Current
Water Resources								
Water Resources Group	Catchment	AW, EA,LWT, SLF, W&DIDB, WRT	Investigate and identify the causes affecting water level and flow changes that are detrimental to the health of the river. A work plan will be developed to initiative projects to address the issues, plus close working with the Resource Protection and Habitats Groups to ensure multiple benefits		All		Improvement of water levels and flow across the catchment, promotion of responsible water use by all	Current
Communication and community								
Social media and website	Catchment	WRT	Promote the work of the WVP using Facebook, Twitter and the WRT website, using them as a resource to keep WVP project information up to date and hold general information Utilise Facebook and Twitter, develop a new user-friendly website with full WVP information	1-2 months		£1,500	Facebook and Twitter sites created and in use. Website currently being developed but WVP text available on current platform	Current
Community meetings	Market Harborough Stamford	WRT	Promote the work of the WVP and specific projects including the 'Welland for People and Wildlife' CRF bid at Market Harborough Inform residents of our projects and gain support and suggestions	1-2 months		£500	Awareness raising of the WVP projects to gain community involvement	Complete

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
PR	Catchment	WRT, EA, UoL	Provide on-going information about our progress and new developments through press releases, newsletters and other publications			Minimal		
Promote the River Improvement Plan	Catchment	All	Send the River Improvement Plan to organisations and engage them in dialogue about ways in which they could get involved in implementing it.	On-going	All	Postage costs	Engagement of new partners and communities, further implementation of our projects, leverage funding	Current
Community events	Market Harborough and Stamford	WRT, UoL	Hold 'Bioblitz' events in towns in Spring 2013 to raise community awareness, plus community wildlife surveys	2013 1-2 months		£1,000		Planned
Educational visits	Market Harborough	WRT	Offer visits to the 13 schools in the town to raise awareness of what is in the river and how we can make it a better place for wildlife as part of Welland for People and Wildlife Project	2013			Community awareness and ownership of the river	Planned
Data collection	Catchment	WRT, UoL,	Collate any available data about the catchment and display using GIS mapping software that can be used as a resource by all. Data Officer employed by WRT using funding from UoL	July to December 2012		£6,000	Community awareness of the river, provision of evidence	Complete
Statutory Duties								
Sampling Programme	Catchment	EA	Implement a comprehensive sampling programme including: water quality, biological, fish population and dedicated WFD compliance.	On-going	All	N/A	Baseline of scientific data.	Current
Consultation on planning applications	Catchment	EA	Respond to planning applications on which the EA is consulted to ensure WFD compliance, no deterioration in WFD status and where possible WFD improvements.	On-going	All	N/A	No deterioration	Current
Water Resources Management	Catchment	EA	Implement the Catchment Abstraction Management Strategy (CAMS) process to ensure sustainability of regulated abstraction.	On-going	All	N/A	Maintenance of environmentally required flow	Current

Project	Location	Partners	Outline and Aims	Timescales	WFD target	Cost	Outcome	Status
Water quality regulation and Pollution control	Catchment	EA	Prevent and prosecute for pollution events. Ensure compliance with consents allowing discharge of effluent to the river	On-going	All	N/A	Improved water quality	Current
Flood risk management	High Consequence water bodies	EA	Manage high consequence flood risk water bodies to ensure delivery of both GES and flood risk outcomes.	On-going	Habitats, Hydromorph.	N/A	Habitat improvement	Current
Helpston Ground Water Treatment Plant	Welland below Stamford	EA	Prevent further pollution of Lincolnshire Limestone Aquifer at Helpston from pollutants from historic landfill and therefore any flow of polluted water into the Welland system.	On-going	Water quality	£390,000 PA	Water quality improvement	Current
River Basin Planning	Catchment		Plan for the delivery measures to improve the ecological status of all water bodies	2015	All		Place the priorities of this plan into the RBMP	Current
Water industry - PR14 (Price Review)	Catchment	AW	Contribute to the determination of water prices and water company investments by Ofwat. Environmental enhancements delivered under the National Environment Programme to meet UK and EU targets including improving discharge from sewage treatment works, ensuring abstraction has no negative effect and preventing chemicals entering groundwater.	2015-2020	Water quality	N/A	Environmental enhancements to improve water quality and habitats	Current
AMP5 (Asset Management Programme)	Catchment	AW	Contribute to the development of water company Asset Management Plans.	2010-2015	Water quality	N/A		Current
Land drainage	Lincolnshire	W&DIDB	Adhere to flood risk strategies and authorities, maintain drainage in its designated area and maintain and improve the surrounding environment	On-going	All	N/A	Reduced flood risk, improved habitats and water quality	Current
Designated areas	Catchment	NE	Manage and maintain important designated areas including SSSIs, SPAs and NNRs, and designate new areas that have been identified as important for protecting wildlife	On-going	Habitats and Water quality	N/A		Current
Wildlife law	Catchment	NE	Enforce laws to protect wildlife and issue licences for works to be carried out that is not detrimental to wildlife	On-going	Fish	N/A	Protect wildlife and their habitats	Current

Appendix 1: Map of Water Framework Directive 'reasons for failure'



Appendix 2: The Welland Valley Partnership and its Groups

On the formation of the Welland Valley Partnership in August 2011, it was quickly decided to form two Groups to tackle specific challenges. The Resource Protection and Habitats Groups have been proactive in taking actions which promise to bring great benefits. Our additional Water Resources Group will develop a plan to tackle water levels and flow issues. This appendix provides more information on the organisation and workings of each Group. Details of their activities, including notes of their meetings, are being made available on the Welland Rivers Trust website.

Welland Valley Partnership Steering Group

The Steering Group first met in August 2011 with the aim of improving the ecological status of the Welland Valley and engaging others to achieve this. Since its formation new organisations have joined the Partnership and successful relationships have been built that have enabled much progress in a short time. The Steering Group meets every six weeks or so to discuss progress and develop future plans.

Members

Angling Trust
Anglian Water
Environment Agency
Game and Wildlife Conservation Trust
Lincolnshire Wildlife Trust
Market Harborough District Council
National Farmers Union
Natural England
Rutland County Council
South Lincolnshire Fens Partnership
Welland & Deepings Internal Drainage Board
Welland Rivers Trust

Resource Protection Group

The Group was established in October 2011 to tackle diffuse pollution. It meets every two months. It already has a significant presence on the Welland Rivers Trust website. The Group reports back to the Partnership's Steering Group. It benefits from considerable help in kind and voluntary action from its members.

Members

The Group brings together local experts and organisations to tackle diffuse pollution in the Welland Valley. The current members are:

Anglian Water
Country Land and Business Association
Environment Agency
Game and Wildlife Conservation Trust
Independent farm advisor

National Farmers Union
Natural England
Welland Rivers Trust

Terms of reference

The purpose of the Group is to:

'review diffuse pollution in the catchment in view of funding over the next four years and recommend areas, communities and issues to tackle'.

The Group is tackling diffuse pollution from several sources, including:

- Run-off from arable fields, grassland, farm tracks and farmyards.
- Discharges to watercourses from surface water drains serving highways, homes and industrial estates.
- Run-off from soakaways serving septic tanks.

Habitats Group

This Group is examining why fish populations in the Welland and its tributaries are so poor, and identifying opportunities to improve habitat where possible. The Group has produced a habitat action plan which sets out its projects up to 2015 and how it will achieve them.

Members

Angling Trust

Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust

Environment Agency

Lincolnshire Wildlife Trust

Welland Rivers Trust

Woodland Trust

University of Leicester

Other organisations have been invited to attend the group or comment on its activities

Terms of reference

The purpose of the Group was defined by the partners attending the initial meetings as:

'...a forum to discuss and agree potential habitat projects that will aid improving the current Water Framework Directive ecological status of the River Welland and its tributaries within the pilot catchment area, but also consider and promote projects that will contribute mutual benefits beyond the river bank'.

Water Resources Group

Our newest Group is currently inviting organisations with expertise in water level and flow issues to attend its initial meetings. The Group will develop a plan of activities and projects for implementation from 2013.

Members

Anglian Water

Environment Agency

Independent member

Lincolnshire Wildlife Trust

South Lincolnshire Fens Partnership

Welland & Deepings Internal Drainage Board

Welland Rivers Trust

Terms of reference

The Group will develop its terms of reference taking account of stakeholder concerns and current issues around water quality and flow to determine where its efforts should initially be targeted.

If you can develop projects in these areas or want to make real improvements to the rivers and would like to become involved with one of our Groups, please contact the Project Officer for more information at info@wellandriverstrust.org.uk.

Appendix 3: Habitat Opportunities Mapping project

Brief

The Habitats Group was set up primarily to address the low habitat quality that is found along the Welland and its tributaries, but also to contribute to action to improve river flows and tackle diffuse pollution issues. This mapping exercise was intended to obtain information on projects, either planned or aspirational, to: mitigate flows; restore or create habitats; or provide additional ecological benefits beyond the riverbank.

Consultation

Over 50 individuals from the organisations listed below were contacted and asked to provide details of their current projects, or ideas for aspirational projects that they would like to see in the Welland Valley.

Anglian Water	National Farmers Union
Angling Trust	Peterborough and District Angling Association
Beds, Northants & Cambs Wildlife Trust	River Nene Regional Park
British Dragonfly Society	Robinsons Farm Drayton Angling Club
Campaign for the Farmed Environment	RSPB
CLBA	Rural Community Council (Leics and Rutland)
Deeping St James Angling Club	Rutland County Council
East Midlands Angling Federation	Rutland Together
Environment Agency	Rutland Water Nature Reserve
Forestry Commission	Rutland Water Partnership
Game & Wildlife Conservation Trust	South Holland District Council
Gwash Fishing Club	South Lincolnshire Fenland Partnership
Landscape historian	University of Leicester
Leicestershire & Rutland Wildlife Trust	Welland & Deepings Internal Drainage Board
Leicestershire County Council	Welland Mayfly Fishers
Lincolnshire County Council	Welland Rivers Trust
Lincolnshire Wildlife Trust	Woodland Trust
Natural England	

What we hope to achieve

We do not think that this is the end of finding out about potential projects to improve habitat across the Welland Valley. This initial stage has provided excellent information to start working out who we can work with on our project, and to develop new ones, as well as to provide resources. We can prioritise the habitat opportunities to areas where they will enable the greatest improvement to the health of the river, and also look to link up quality riparian and other habitats across the Welland Valley. We can also identify where there are gaps in activities providing benefits to the health of the rivers.

The results of the consultation can be seen on the A3 size map on the next page. An A1 size version will be available to download on the Welland Rivers Trust website, with a facility to zoom in for more detail

Welland Valley Partnership: Preliminary identification of habitat creation projects and related opportunities

Over 50 individuals and organisations, including members of the Welland Valley Partnership Habitat Sub-Group, were asked to identify habitat creation projects and related opportunities that could contribute to the improvement of the current Water Framework Directive ecological status of the River Welland and its tributaries. This map shows the range of mechanisms, ongoing projects, future plans and aspirations for habitat creation and linkage that the consultees identified.

- Catchment-wide opportunities**
- Higher Level Stewardship (HLS). Natural England.**
HLS is available outside the HLS Target Areas identified on the map for high quality/multi-objective schemes that address specific themes, including:
- Improving the resilience of Nationally Important (UK Biodiversity Action Plan) habitats to climate change.
 - Reversing the decline of farmland birds.
 - Securing the recovery of Nationally Important (UK Biodiversity Action Plan) species.
 - Improving the quality of nationally important water bodies and/or habitats adversely affected by diffuse water pollution from agriculture. HLS applications will be targeted at soils that are at moderate to very high risk of soil erosion.

- England Woodland Grant Scheme: Woodland Creation Grant (WCG). Forestry Commission.**
WCG contributes to the costs of establishing new woodlands. Additional Contributions (ACs) are available for new woodland plantings that deliver specific priorities, including **New Woodlands for Water**. New planting can help reduce flood risk and diffuse water pollution by:
- Reducing water runoff.
 - Slowing the flow when rivers are in flood.
 - Protecting stream banks from erosion.
 - Protecting sensitive soils from erosion and reducing sediment delivery to water courses.
 - Intercepting sediment and pollutants in runoff.
 - Intercepting pesticide spray drift.
 - Reducing fertiliser and pesticide usage.

Woodlands for Water target areas within the Welland catchment are currently being identified.

MOREwoods. Woodland Trust.
MOREwoods provides a funding contribution for landowners to plant trees. The scheme also provides on-site advice to landowners and assistance with England Woodland Grant Scheme applications. Projects providing water-related benefits may be fully funded. The WFD related benefits of woodland planting are shown under the England Woodland Grant Scheme (above).

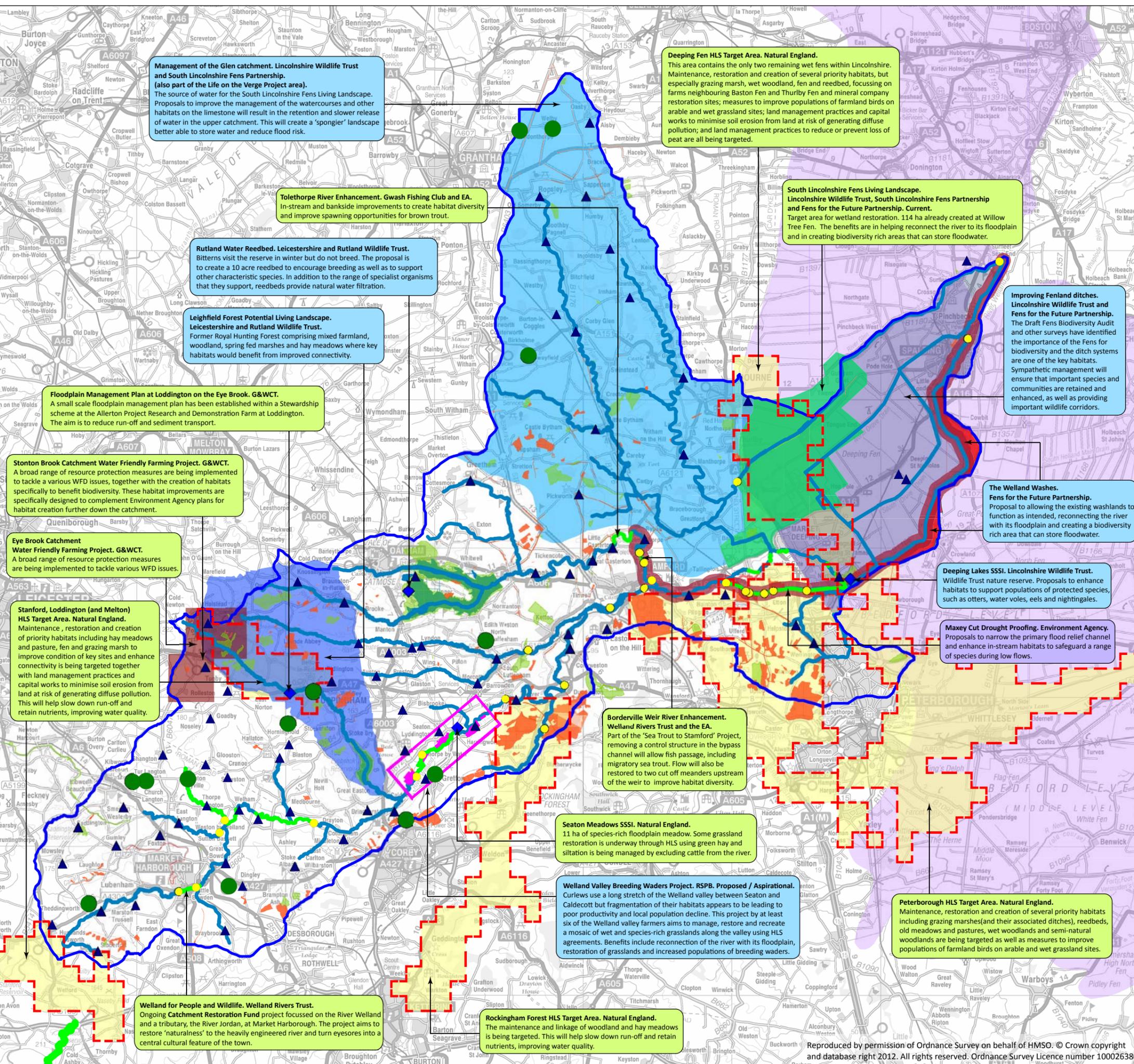
Creating Cool Rivers.
Several organisations, e.g. Woodland Trust, are promoting the planting of riparian woodlands and individual trees on the south side of rivers to lower water temperatures, stabilise the bank and provide a source of woody debris to benefit fish and other aquatic life.

Sewage treatment works: habitat creation opportunities. Anglian Water.
There are opportunities for habitat creation, e.g. woodland and grassland, at some sewage treatment works. Anglian Water has agreed to identify land within its treatment works where new habitats that tackle WFD issues could be created.

Sea Trout to Stamford Project
A suite of fish pass and habitat enhancement proposals designed to restore a sustainable sea trout run on the river. The initial priority is to create connectivity from "Wash to Gwash".

Key:

- River Welland Catchment Boundary
- Text Current / Ongoing Project
- Text Planned / Proposed Project
- Text Aspirational Opportunity
- Site of Special Scientific Interest
- Local Wildlife Site
- HLS Target Area
- Welland Washes
- Fens for the Future Project Area
- Sea Trout to Stamford Project (See Catchment-wide Opportunities)
- RSPB Breeding Waders Project Target Area / Site
- Proposed River Restoration Reach
- MOREwoods Planting Site (See Catchment-wide Opportunities)
- River Obstruction: Priority location for fish/eel pass
- ▲ Sewage Treatment Works (See Catchment-wide Opportunities)
- ◆ Other Opportunities



Appendix 4: Good Ecological Status indicators

There are over 30 different criteria that determine if a water body is considered in Good Ecological Status under the Water Framework Directive. These fall into three categories: biological, chemical and physical. The indicators listed below have been identified as a 'reason for failure' in the Welland catchment.

Biological indicators

Biological indicators are the living organisms found within the river and their absence can be the first sign that it is not healthy. They are greatly affected by the habitat and chemicals within the water.

Fish species within the Welland are varied and include many Biodiversity Action Plan species such as brown sea trout, Atlantic salmon, and European eel. Surveys have shown that diversity and numbers of fish in the Welland have declined dramatically, and in some stretches only one or two fish have been found. The reasons include habitat quality and water chemistry and flow. The fish primarily associated with the Welland need gravel beds to successfully spawn, an abundance of invertebrate species upon which to feed, and plenty of dissolved oxygen in the water. All of these depend on the chemicals found in the water. Increased levels of phosphate, especially in slow or still water, encourage excessive weed and algal growth, choking the water leading it to become stagnant though low levels of dissolved oxygen. Sediment covers the gravels on the river bed and release chemicals into the water. Hydromorphological changes can create a barrier to fish migration. In the Welland pilot catchment area, **39% of water bodies fail for fish populations**. Efforts to remove barriers, increase dissolved oxygen, lower phosphate and improve habitat will help to restore fish numbers.

Macrophytes are plant species that live in or near the water and can include water lily, bryophytes (mosses) or algae. They are highly responsive to water quality so it can easily become apparent when pollution enters the water, and to changes to light levels through the water or depth. Increased levels of nutrients including phosphate can lead to replacement of naturally occurring species by filamentous algae which clog the river. Macrophytes play an integral role in maintaining a healthy river ecosystem by providing spawning habitat for fish and producing oxygen through photosynthesis. They also trap sediment and absorb phosphate from the water. In the Welland pilot catchment area, **9% of water bodies fail for macrophytes**. Reduction of pollution, natural water flows and natural banks instead of concrete will improve macrophyte populations.

Invertebrates include the insects that are found in and around the water. Surveys can quickly determine the quality of the water and habitat, as many are only found in high-quality rivers with low pollution levels, high dissolved oxygen and low sediment. Others are more tolerant of a lower quality river. They are an important source of food for fish and an integral part of the river ecosystem. In the pilot catchment area, **9% of water bodies fail for invertebrates**. Reducing sediment and phosphate and ensuring a low water temperature will improve invertebrate populations along the Welland.

Diatoms are unicellular algae that can vary in size and shape. They provide a food source for the freshwater invertebrates that live in the rivers. They are sensitive to high water temperatures, high levels of phosphate or other pollutants and sediment. In the Welland pilot catchment area, **9% of water bodies fail for diatoms**. Reducing sources of pollution and sediment will reduce excessive diatom populations within the River.

Chemical indicators

Chemicals that are found within the water can include phosphate, nitrogen, dissolved oxygen, oils or any industrial chemicals or pesticides. They have a huge impact on the living organisms that live in and around the river, and changes in these are often the first sign that there is a problem with the water chemistry.

Phosphate is a chemical nutrient and can come from a variety of sources including pesticides, manure, artificial fertilisers, sewage treatment works, septic tanks, household products and many others. Increased levels of phosphate can affect the species composition of invertebrates and macrophyte growth, often leading to phosphate-tolerant plants dominating the river. In turn, light reaching the river bed and reduced dissolved oxygen levels cause stagnation. This is a process known as eutrophication - *“The enrichment of waters by inorganic plant nutrients resulting in stimulation of an array of symptomatic changes including... increased production of algae and/or other aquatic plants affecting the quality of the water and disturbing the balance of organisms within it”*¹. In the Welland pilot catchment area, **45% of water bodies fail for phosphate levels**. Reducing phosphate levels by addressing diffuse and point source pollution sources, and improving river flows, will help to reduce its negative impacts.

Dissolved oxygen in the water is essential for the fish and invertebrate species in the water. Low levels of dissolved oxygen can often be demonstrated by the fish or invertebrates that are found, with some present only in rivers with high dissolved oxygen. Macrophytes produce oxygen by photosynthesis and release it into the water during the day, but respiration at night removes dissolved oxygen so having too much plant matter in the water will be deleterious. In the Welland pilot catchment area, **18% of water bodies fail for dissolved oxygen levels**. High water temperatures, excessive weed or algal growth and pollutants can lower dissolved oxygen levels. Removing concrete banks that increase macrophytes, reducing water temperatures and reducing pollutants will help to improve dissolved oxygen levels.

Ammonia is a gas that is emitted from livestock slurry and is present in fertilisers, which dissolve in water. It alters the acidity (as measured by pH) of the water, and the free unionised ammonia is toxic to fish and invertebrates. It also increases nitrogen levels in the water, leading to increased weed and algal growth and the associated problems. Many fish and invertebrates are sensitive to pH changes. In the Welland pilot catchment, **15% of water bodies fail for ammonia**. Reducing fertiliser run-off into the water and preventing livestock entering the river other than via a single-point cattle drinker can improve ammonia levels.

Physical indicators

Physical changes to the River that change its water level and flow are said to affect its **hydromorphology**. Such modifications include: straightening and deepening of channels; installation of weirs, sluices or flood defences; and raising the river level above the surrounding land. All of these modifications can cause severe habitat degradation, affecting the living organisms within the river. Changes in natural flow rates between summer and winter or after heavy rainfall can also be impacted by these modifications. In the Welland pilot catchment area, **48% of water bodies fail** under the Water Framework Directive for this indicator.

Removal of physical barriers enables fish to pass freely. Re-naturalisation of the river through the installation of materials to re-create natural riffles and pools greatly improves habitat quality. A natural and adequate flow along the river also improves habitat quality and the biological and chemical indicators.

¹ Environment Agency (1998) *Aquatic Eutrophication in England and Wales: a proposed management strategy*. Consultative Report, Environment Agency, 36pp.

Appendix 5: Climate change predictions in the Welland catchment

The information below has been provided by the Environment Agency's Climate Ready Support Service.

Climate Change Projections for the Anglian Region

Introduction

This document provides climate change projections, drawn from the latest UK Climate Projections (UKCP09) and the Centre for Ecology and Hydrology, for the Welland catchment in the 2050s. It has been produced as part of the Environment Agency's Climate Ready support service. Please feel free to use the following information in stakeholder engagement or the Catchment Management Plan. If you would like any more support or information, please contact Julian Wright at: julian.wright@environment-agency.gov.uk

The document is composed of three sections:

1. Overview of observed findings in relation to climate change
2. Climate Projections from UKCP09 for the catchment
3. National maps showing the impact of climate change on future flows

Overview of observed findings in relation to climate change

According to the Intergovernmental Panel on Climate Change¹ the warming of the global climate system is unequivocal, with global average temperatures having risen by nearly 0.8°C since the late 19th century, and rising at about 0.2°C per decade over the past 25 years. It is very likely (>90% probability) that man-made greenhouse gas emissions caused most of the observed temperature rise since the mid-20th century. In the UK rainfall appears to have decreased in summer and increased in winter, although with little change in the latter over the last 50 years¹.

These observed trends are expected to continue into the future with precipitation decreasing in the summer and increasing in the winter due to additional heavy precipitation events¹. The increased temperatures and altered rainfall will modify patterns of river flow and groundwater recharge, affecting the availability of water and changing the aquatic environment³.

Climate Projections for the East Midlands under medium emissions in the 2050s^{2,5}

- The central estimate of **winter mean temperature** rise is 2.2°C; it is very unlikely to be less than 1.1°C and is very unlikely to be more than 3.4°C.
- The central estimate of **summer mean temperature** rise is 2.5°C; it is very unlikely to be less than 1.2°C and is very unlikely to be more than 4.2°C.
- The central estimate of change in **winter mean precipitation** is 14%; it is very unlikely to be less than 2% and is very unlikely to be more than 29%.
- The central estimate of change in **summer mean precipitation** is -16%; it is very unlikely to be less than -36% and is very unlikely to be more than 6%.

Climate Future Flows Maps

Future Flows provide an assessment of the impact of climate change on river flows using a consistent approach across 282 catchments. The climate future flows maps have used the same climate model which the UKCP09 projections are based upon (see above). The model produces various projections taking into account different assumptions of possible climate behaviours and feedback; the 11 scenarios used within the model provide an indication of the uncertainty associated with climate projections⁴.

Further information and flow predictions may be found on the NERC website³.

¹IPCC (2007) Available at: <http://ukclimateprojections.defra.gov.uk/22647> (last accessed: 26/11/12)

²UKCP09 (2012) Available at: <http://ukclimateprojections.defra.gov.uk/22130> (last accessed: 26/11/12)

³NERC (2012) Available at: http://192.171.153.213/sci_programmes/Water/FutureFlowsandGroundWaterLevels.html (last accessed: 26/11/12)

⁴NERC (2012) Available at: http://192.171.153.213/sci_programmes/Water/FutureFlowsandGroundWaterLevels.html (last accessed: 27/11/12)

⁵The 2050s timeslice is the average for the period 2040-2069.

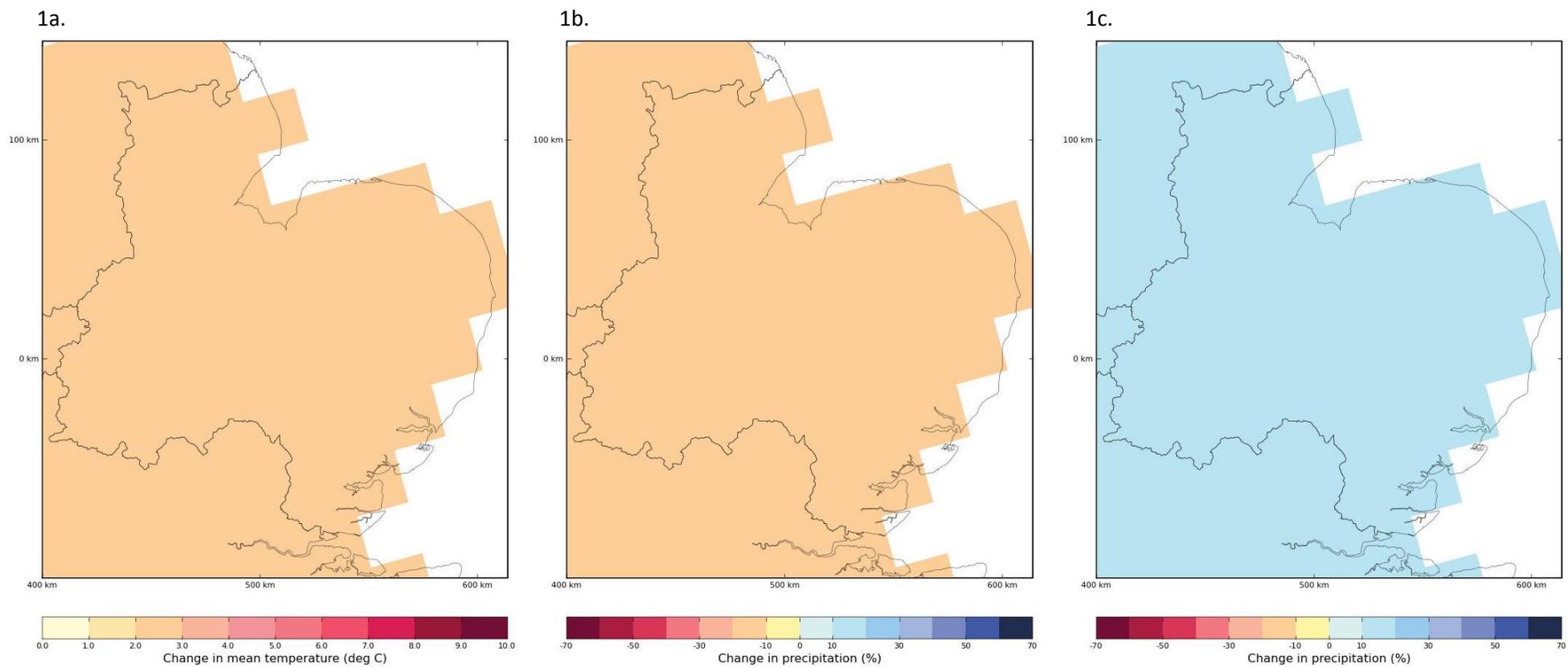
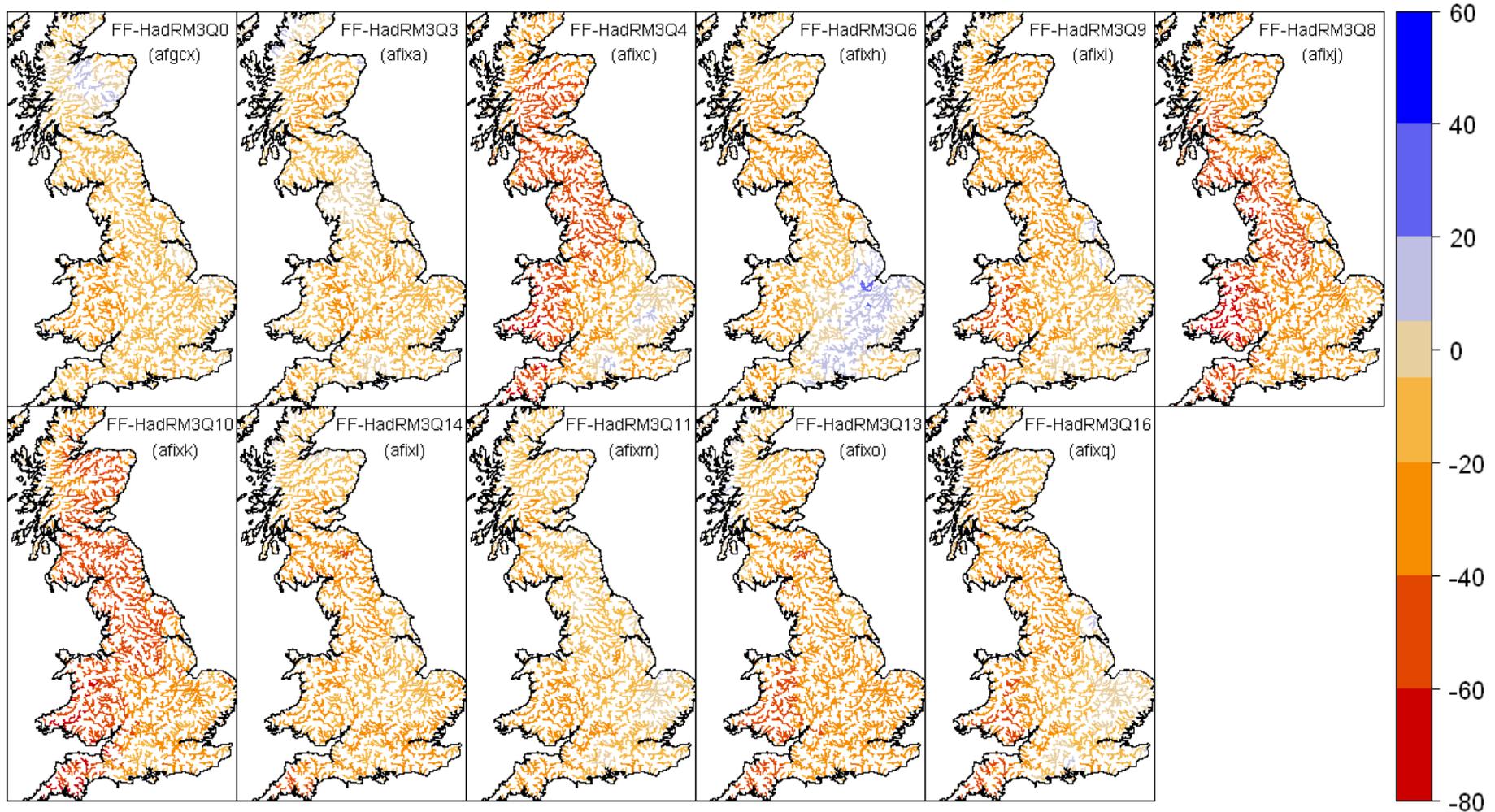


Figure 1: Modelled changes for the Anglian river basin ($^{\circ}\text{C}$) in the 2050s⁵ at a 50% probability level. 1a represents mean temperature, 1b the change in summer precipitation and 1c the change in winter precipitation⁶. © UK Climate Projections 2009

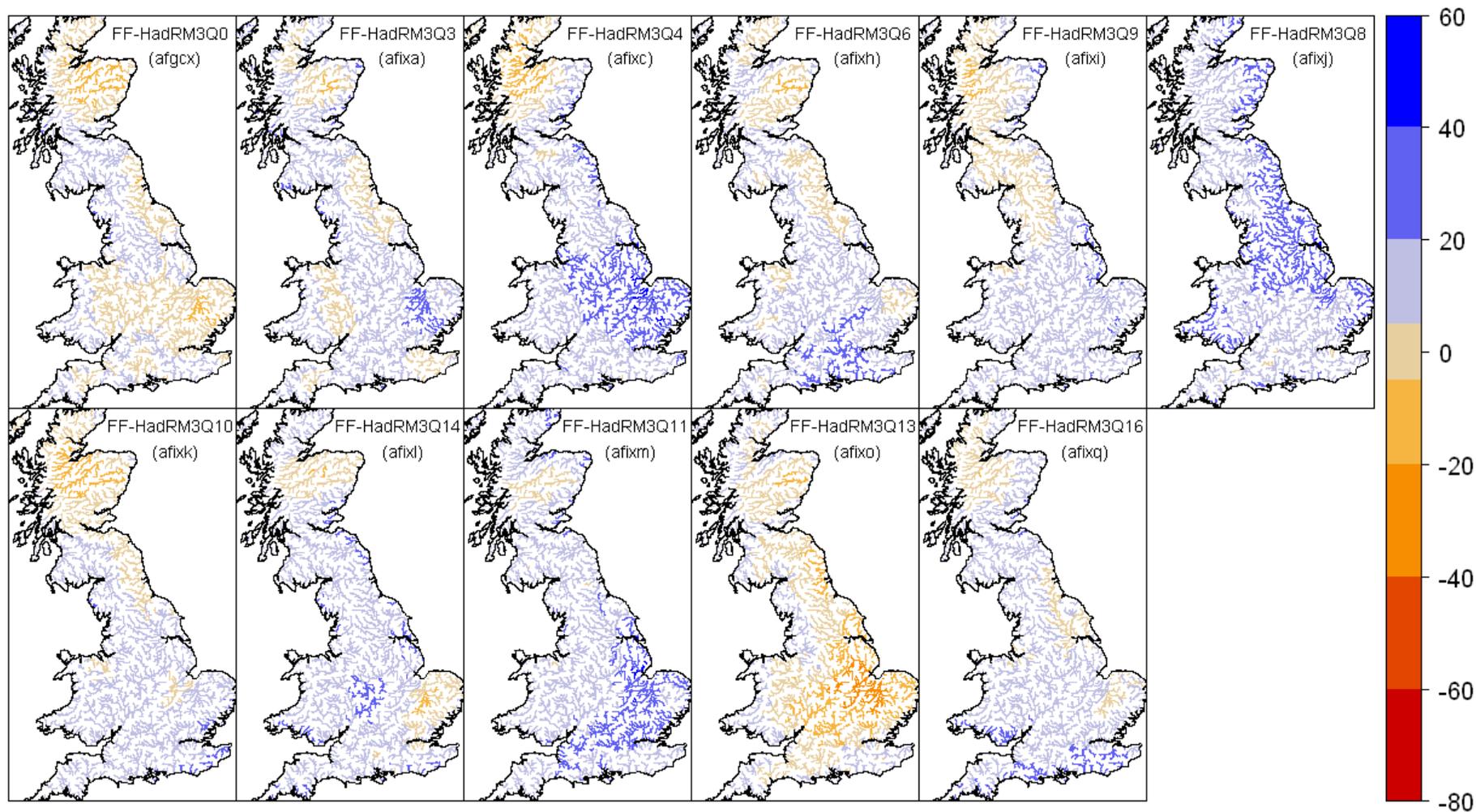
⁶UKCP09, (2012). Available at: <http://ukclimateprojections.defra.gov.uk/21780> (last accessed 05/12/12)



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Figure 2: Modelled changes in future summer flow (%) for the 2050s⁷ for 11 different future climate change scenarios. © NERC (CEH) 2012

⁷NERC, (2012). Available at: http://192.171.153.213/sci_programmes/Water/Future%20Flows/FFRiverFlows-Summer.html (last accessed 27/11/12)



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Figure 3: Modelled changes in future winter flow (%) for the 2050s⁸ for 11 different climate change scenarios. © NERC (CEH) 2012

⁸NERC, (2012). Available at: http://192.171.153.213/sci_programmes/Water/Future%20Flows/FFRiverFlows-Winter.html (last accessed 27/11/12)

