

Ecclesbourne



love your river

We're in it together

**The Ecclesbourne
Restoration Partnership**

**An Improvement Plan for the
River Ecclesbourne and its Valley**



From Small Rivers

Eccles, either aec-laes, an oak pasture,
or a gathering, as in ekklesia,
Bourne, a stream, where the raindrops go
in the dark, in the deep
where the Ecclesbourne flows

From Gorsey Bank, Sprink Wood, she wends
to Turnditch, Duffield, into Derwent, Trent,
Humber, North Sea, the cycle follows
in the dark, in the deep
where the Ecclesbourne flows

Underground, overground, fish and fossils,
brachiopods, bivalves, crinoids, gastropods,
old as the hills, black as a crow
in the dark, in the deep
where the Ecclesbourne flows

Walkers and fishermen, down by the water,
cattle and trout, and bring back the otter -
if we look after small rivers, large rivers grow
in the dark, in the deep
where the Ecclesbourne flows

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Our Vision

We will work together to improve the land and water environment of the Ecclesbourne Valley, through physical improvements, pollution prevention, advice, guidance and information.

We will use our collective resources to improve water quality and biodiversity, by reducing pollution and improving fish migration, by 2027.

Through events and education, we will raise awareness of the river and its surrounding environment amongst those who live and work within the Ecclesbourne Valley.

This plan has been developed by the following organisations:



We're in it together

Foreword

The River Ecclesbourne has its source above the historic lead mining town of Wirksworth, with the very top of the valley now occupied by the National Stone Centre and the Derbyshire Eco-Centre. This is also where the Ecclesbourne Valley Railway, named after the river, begins.

The river flows through Wirksworth, where it is known as the Hannage Brook, before winding its way through a broad valley of mixed farm land and scattered villages, until it meets the River Derwent at Duffield; a length of about nine miles.

It is popular with walkers who enjoy a stroll along its banks, and with anglers who enjoy the appeal of its brown trout population; cattle use it for drinking, and it also dilutes and carries away waste water from the people and businesses within the valley.

Faithful and constant as the river is, we are not always inclined to treat it with respect. In the past, intensive land management and pollution have taken their toll on the quality of the river but more recently, through careful land management and regulation, these are being addressed and the decline is being reversed.

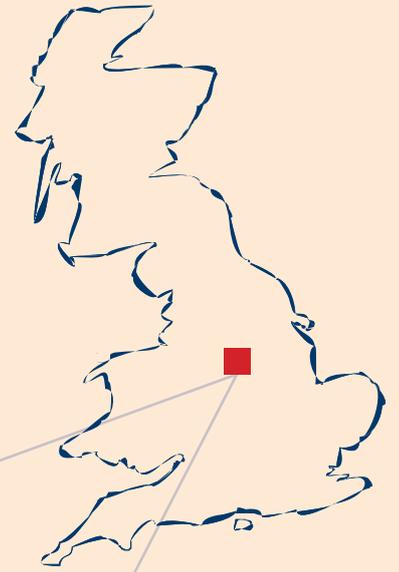
We want to protect and enhance the quality of the River Ecclesbourne, its surrounding habitats, and biodiversity. We have established the Ecclesbourne Restoration Partnership and a plan to achieve this, and also to raise awareness of the river and its environment amongst those who live and work nearby. We want to make the most of the role of the local community to deliver these environmental improvements through events, education and direct work.

There is much to do, so please read on...

Contents

Our Vision	2
Foreword	3
Contents	4
Ecclesbourne Valley	5
Our Starting Point	6-7
Section 1 - Farming	8-10
Section 2 - Community	11-13
Section 3 - Wildlife	14-18
Section 4 - Water Quality	19-21
Section 5 - Access, Recreation and Tourism	22-24
Section 6 - Flood Risk	25-29
Conclusion and Way Forward	30
How to Get Involved	31

Ecclesbourne Valley



Wirksworth

Kirk Ireton

Shottle

Biggin

Idridgehay

Shottle Gate

Hulland Ward

Cowers Lane

Cross o'th' Hands

Turditch

Windley

Hazelwood

Duffield

Carsington Water

Access, Recreation and Tourism
Raising the profile of the catchment and supporting the rural economy.

Water Quality
Monitoring, improving waste water treatment, raising awareness of phosphate pollution.

Community
Volunteering and education.

Farming
Help and advice, waste management and cost reduction.

Wildlife
Monitoring, habitat improvement work, removal of invasive species.

Flood Risk Management
Management and, where possible, reduction.

Our Starting Point

The partnership and plan

The Ecclesbourne Restoration Partnership was formed in September 2011 to work with farmers, land owners, businesses, schools, and the community, to improve awareness of the river and the wider environment.

The partnership aims to work with the community to find new ways to tackle issues that affect the Ecclesbourne River, and the lives of the people and wildlife in the valley.

Project Partners include: the Environment Agency, Derbyshire Wildlife Trust, Severn Trent Water, National Farmers Union, Derbyshire County Council, Natural England, and the Amber Valley Ramblers.

The River Ecclesbourne forms part of a national initiative, the 'catchment based approach', launched by the Department for Environment, Food and Rural Affairs (Defra) in April of 2011. Richard Benyon, Environment Minister, announced that Ecclesbourne had been chosen as one of the first pilots in the initiative.

These pilots take a new collaborative approach to protecting and improving the health of our water environment and tackle issues across the whole of the river catchment.

This plan sets out the 6 main areas where we hope to make a difference. It also captures the actions that the partnership has identified over the 15 months that the pilot has been running. Some of these actions are already being delivered, others rely on obtaining funding in the future and will form part of the next phase of the project.

We hope that the Ecclesbourne Restoration Partnership will work towards safeguarding the vitality of the valley for years to come.

What is the Water Framework Directive?

In 2000, the Water Framework Directive, a unifying European Law, came in into force requiring all countries in the European Union to bring their rivers and lakes to Good Ecological Status. The Directive recognises the economic and ecological importance of rivers and their wildlife, and sets out a framework for protecting them. It embodies four main concepts:

- It draws together existing legislation

- It embodies a catchment based approach crossing political boundaries
- It aims to bring all surface waters (rivers, lakes, coastal waters) in EC member countries to Good Ecological Status by 2027
- The promotion of the role of people and the community in achieving its targets

All pilots in the Defra initiative include waters which fail to meet the standards expected by the Water Framework Directive.

What are the problems and why do we need to do something?

One of the main issues facing the Ecclesbourne and its tributaries is nutrient enrichment, particularly from phosphate. This can lead to undesirable changes in the ecology of the river, including large growths of algae, weedy plants and microscopic life. These in turn

affect other species at all levels of the food chain. We understand where some of the main sources of phosphate are, and we know that they are having a negative effect on the health of the river and its wildlife.

What are Phosphates?

Phosphates are inorganic compounds containing phosphorous. They are used in fertilizers (as plant nutrient) and in detergents (as 'builders' or water softeners), phosphates are a major source of water pollution. Their presence in lakes and ponds

encourages excessive algae growth which depletes water-dissolved oxygen, resulting in elimination of other forms of aquatic life.

The river also suffers from the impact of too much silt; this is fine particulate material which occurs naturally but can cause problems when present in excessive amounts. It affects fish and wildlife by smothering habitat for small creatures such as insect larvae which live on the river bed, and clogging up the stones and gravels preventing fish from spawning.

Fish passage is also a concern and there are several barriers to fish movement on the main river, in particular the weir at Snake Lane. Some fish need to migrate along the river to complete their life cycle, so barriers can seriously limit fish communities and reduce biodiversity further.

However these water specific related issues are not the whole story, just the starting point. To deal with them effectively requires a much broader approach to the catchment as a whole.

What the project plans to do

These are the six areas where we want to make a positive difference to our environment:

- **Farming** - help and advice, waste management and cost reduction.
- **Community** - volunteering and education.
- **Wildlife** - monitoring, habitat improvement work, removal of invasive species.
- **Water quality** - monitoring, improving waste water treatment, raising awareness of phosphate pollution.
- **Access, recreation and tourism** - raising the profile of the catchment and supporting the rural economy.
- **Flood risk** - management and, where possible, reduction.

What we are already doing to improve the catchment



Newly restored river channel at Duffield, Derbyshire.

The Ecclesbourne Restoration Partnership has already started work with the Environment Agency, erecting fencing to protect river banks from damage by cattle, and restoring the original river channel at the former colour works in Duffield, so fish can get past a weir.

Severn Trent Water have installed a pilot plant at Wirksworth Sewage Treatment Works to significantly reduce phosphate in the works effluent and Derbyshire Wildlife Trust are building on the work of angling clubs, to remove invasive Himalayan Balsam, and have run a number of community events.



What is 'Love Your River'?

'Love Your River' is a campaign that aims to highlight the link between river health and water use, so that people understand and value water and take action to improve their local rivers and the environment around them.

Drought, over-use, and pollution threaten the health of our rivers and we all have a role to play in investing in their future.

Backed by Defra, and a coalition of Non Governmental Organisations and water companies, the campaign celebrates

the importance of rivers to local people - for their health, well-being, leisure and sport. Through this campaign we want to recognise the great work that local groups already do to look after their rivers.



Section 1 - Farming

There are about 80 farms in the Ecclesbourne catchment, including beef, sheep, dairy, poultry, arable and mixed. These range from a few acres in size, to that owned by the Chatsworth Estate.

We have established a group to work with the farming community. We want to show how land management activities can be undertaken to reduce diffuse pollution, and encourage ownership of the landscape.

Phosphates

The Water Framework Directive gives us a new opportunity to help the environment. It requires that all our waters are at 'good ecological status' by 2027. Nutrient enrichment, particularly from excess phosphate, is one of the main causes of waters failing to meet this target.

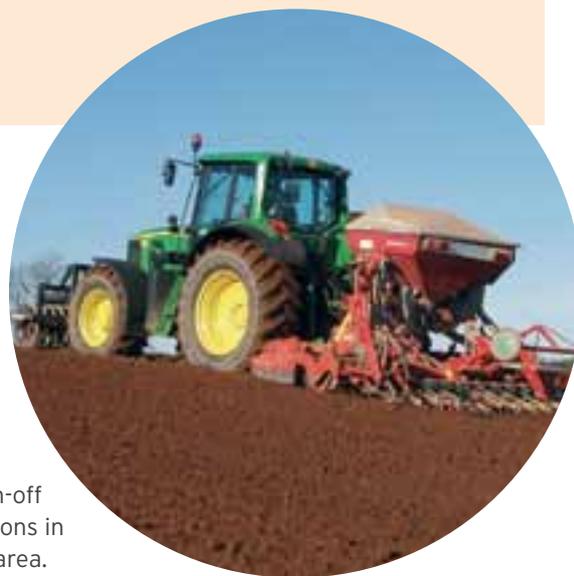
Within the Ecclesbourne Valley there are two principle sources of phosphate: treated sewage effluent works and what is termed 'rural diffuse pollution' (See also page 16 and 19).

Rural diffuse pollution comes from many sources including: run off from fields, tracks and farm yards; run off from rural roads; effluent from septic tanks; and private sewage works.

These all have a potentially negative impact on the water environment. There is also a small amount of urban diffuse pollution arising from surface run-off and misconnections in the Wirksworth area.

At the outset of this pilot project, catchment modelling work identified that about a third of the phosphorous within the Ecclesbourne River was coming from diffuse sources. Joint work between the Environment Agency and the National Farmers Union calculated that the national contribution of phosphates from agriculture in rivers and streams was between 18 to 28 per cent.

Local farmers and land managers are therefore key players in reducing the phosphate input from rural diffuse sources.



What is the difference between point source and diffuse pollution?

Point source pollution enters water at a specific site, such as a pipe outfall. By contrast, diffuse water pollution occurs when potentially polluting substances seeping into surface or ground waters from a wide range of, often unseen, sources.

Diffuse pollution can sometimes occur over a very large area, for example when rainfall washes over and off land (run off), carrying soil and sediment particles with it. Ground waters are also vulnerable to pollutants that travel down from the land surface.

Solutions



Livestock drinking from a pasture pump, a device to prevent river bank damage by cattle.

We want to show how diffuse pollution can occur and how it can be reduced by offering simple, workable solutions. For example: correctly sited drinking troughs for livestock; investment in fully functioning guttering and roof water drainage systems; planning of nutrient use; and relieving compaction in soils.

Simple solutions like these are cheap, and often fundamental to delivering real improvements.

As the scale of the task is large we need a 'one-to-many' workshop approach to disseminate key messages and help bring about changes. However, 'one-to-one' interactions, i.e. farm visits, focussing upon specific issues, will also be undertaken to facilitate tangible improvements.

To do this we aim to:

- Engage with farmers and landowners within the catchment.
- Raise awareness and explain the aims of the partnership.
- Explain how to get involved with the project and what benefits are available.
- Provide advice on reducing diffuse pollution and improving agricultural practice.
- Support farmers and landowners in making changes to meet Water Framework Directive goals.



Brailsford Plough Match.

What is catchment modelling?

The Environment Agency uses a range of computer programmes to forecast water quality. These models range from very simplistic, looking at the impact of a single discharge, to very complex representing entire catchments.

Modelling is important as it enables an effective and proportionate response to tackling pollution.

For the Ecclesbourne catchment, a programme was used to help determine where pollution was likely to be coming from - this approach is called 'pollution source apportionment'.

For phosphorus, the potential sources were identified, and the influence of land, slope, land use and run-off were taken into account. This model showed the contribution of phosphorous from diffuse sources to be about one third of the total, and the rest, approximately two thirds, from point source pollution predominantly sewage treatment works.

Actions - Farming

What	How	Who	When	Sources of Potential Funding
Engage with farmers and landowners to raise awareness and explain the aims of the project and how they can get involved.	<p>Ecclesbourne project farming leaflet:</p> <ul style="list-style-type: none"> • Mailed out to farms within the catchment and available at events <p>Farm events including:</p> <ul style="list-style-type: none"> • Open Farm Sunday • Brailsford Plough Match <p>Farm meetings including:</p> <ul style="list-style-type: none"> • Ecclesbourne Farm Discussion Group <p>Farm walks</p> <p>Contact with farmers and their advisors</p>	<p>Environment Agency</p> <p>Derbyshire Wildlife Trust</p> <p>Natural England</p> <p>National Farmers Union</p> <p>Partners</p>	Mid 2012 - ongoing	<p>Completed farm events and leaflet - operating budgets.</p> <p>Ongoing engagement activities - operating budgets and grant funding.</p>
Provide advice on reducing diffuse pollution.	<p>Land manager workshops</p> <p>Farm visits</p> <p>Farm infrastructure audits</p> <p>Follow up catchment surveys</p>	<p>Environment Agency</p> <p>Derbyshire Wildlife Trust</p> <p>Natural England</p> <p>National Farmers Union</p> <p>Partners</p>	Early 2013 - ongoing	<p>Operating budgets.</p> <p>Grant funding.</p>
Support farmers and landowners in making improvements to meet the Water Framework Directive (WFD) goals.	<p>Grant schemes for work on farms which meet WFD goals.</p>	<p>Environment Agency</p> <p>Derbyshire Wildlife Trust</p> <p>Natural England</p> <p>National Farmers Union</p> <p>Partners</p>	2013 - ongoing	<p>Agri-environment schemes.</p> <p>Environmental Stewardship.</p> <p>Farming and Forestry Improvement Scheme.</p> <p>Environment Agency and Defra through WFD.</p>

Section 2 - Community



Invertebrate sampling

Local people often have the best knowledge of their area, whether through working on a particular site such as farmers, or being keen naturalists, or simply because they walk the area on a daily basis.

This intimate knowledge of a location can be an invaluable addition to the data collected by land management organisations. We want to tap into that wealth of local knowledge and work with local communities along the river catchment to improve and broaden our collective level of understanding.

We would like to provide interested individuals and groups with the opportunity to get involved with the partnership in a variety of ways, so that local communities are at its very centre. It is recognised that community involvement will be an essential component in driving the pilot forward.

Monitoring and surveillance



Through our 'Meander Monitor' initiative, we are offering local groups, interested individuals and schools the opportunity to get involved in surveying and monitoring of both wildlife species and water quality.

We can provide training in methods and techniques in order to facilitate independent, surveying and monitoring.

This could include:

- Walkover surveys, noting bank-side plants and animals of interest, including invasive species
- Invertebrate sampling
- Water quality testing using kits
- Regular visual monitoring of culverts for blockages and pollution



Pond survey

Habitat and species restoration and protection

Community involvement in practical restoration and protection will contribute to environmental improvements.

Volunteers and angling clubs who have been involved in the removal of the invasive species Himalayan Balsam are starting to have an impact. This will become more significant with regular input in future years.

Other potential activities could include involvement in practical conservation projects such as scrub management, tree planting, pond restoration, livestock fencing, and the removal of small barriers to fish passage.

Awareness raising

We will inform local communities about the project and keep them updated with its progress through talks, walks and attendance at local events.

An ongoing 'in schools' programme will enable us to teach the

younger generation about the importance of their local river both for water and wildlife, through a series of inspirational and fun activities, site visits and outdoor learning opportunities.



River monitoring

Actions - Community

What	How	Who	When	Sources of Potential Funding
Awareness raising in schools.	Regular visits into schools in the catchment area and site visits to the river.	Derbyshire Wildlife Trust with input from other partners.	April 2013 onwards	Environment Agency Defra
Awareness raising in the community.	Attendance at local events. Guided talks and talks.	Derbyshire Wildlife Trust with input from other partners.	April 2013 onwards	Environment Agency Defra
Develop a 'Meander Monitor Scheme'.	By training local volunteers in monitoring and surveillance including <ul style="list-style-type: none"> • General habitat surveys and river status • Otter and water vole surveys • River fly monitoring • Water chemistry 	Derbyshire Wildlife Trust, Environment Agency, local communities and volunteers.	Early 2013	Environment Agency Charitable Trusts Defra Local Business Small grant funding
Habitat and species restoration and protection projects undertaken by the community. (see also Wildlife Section Action Table)	Engaging volunteers through awareness raising events and setting up an annual activity programme.	Derbyshire Wildlife Trust, Environment Agency, National England, local communities and volunteers.	Ongoing	Environment Agency Charitable Trusts Defra Agri Environment Funding Local Business Small grant funding
Developing community managed/owned wildlife sites.	Aim to generate interest during pilot project.	All partners and interested groups.	2013 onwards	Environment Agency Defra
Get local groups e.g. schools to provide their own interpretation of sites in the catchment.	Aim to generate interest during pilot project.	Derbyshire Wildlife Trust in collaboration with other partners and the local groups.	2013 onwards	Environment Agency Charitable Trusts Local Business Small grant funding

Section 3 - Wildlife

The Ecclesbourne River supports a variety of wildlife including protected species such as white-clawed crayfish, otter and bullhead, as well as other iconic species like brown trout, dippers, mayflies and kingfishers.

These face many challenges as a result of human activity in the valley, the main ones being pollution, sedimentation, invasive species and physical obstructions such as weirs, all of which have a significant impact.



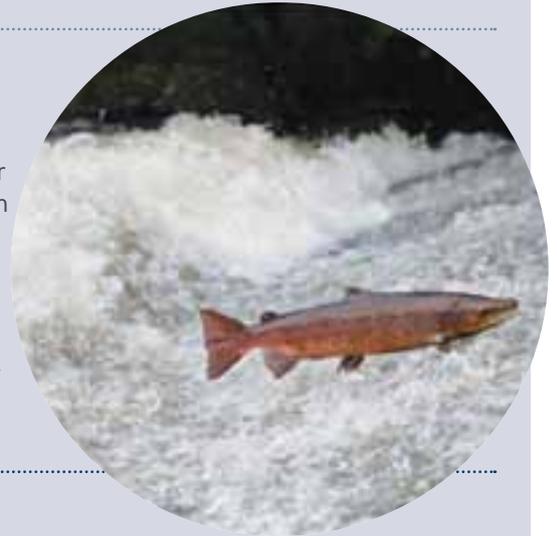
Protected Species

Endangered species are those which are now only present in a fragment of their former range. Although it is a natural process for species to become extinct, for many this process has been

accelerated by man's activities since the industrial revolution. Species which have a particular association with water have been badly affected by pollution and habitat loss.

Migratory Fish

Migratory fish such as Atlantic salmon and common eel both have an important economic value. Salmon spend most of their lives at sea only returning to freshwater to spawn. Eels do the opposite and travel huge distances to the North Atlantic known as the Sargasso Sea to spawn, their young migrating back to spend most of their lives in freshwater. Our rivers are a very important part of their life-cycles. Pollution and impoundments such as dams, reservoirs and weirs prevent these fish from reaching much of their native range. By removing or by-passing these obstacles and cleaning up the rivers we can restore habitat and help these important fish to thrive.



Otter

Otters were on the brink of extinction in the UK only 20 years ago as a result of persecution, poisoning and habitat loss. Now a protected species, important legislation has helped to reverse this decline and now otters are starting to make a comeback. They are an important indicator of habitat quality and their presence indicates a healthy environment.

Water Vole

The water vole has suffered the most devastating decline of any UK mammal over the last 30 years. Once a common site on all watercourses, they now occupy an estimated five percent of their former range. This is a direct result of habitat loss through drainage of wetland and modification of our rivers. The remaining fragmented populations have been severely damaged or lost to predation from American mink, to which the water vole has no natural defence. Although parts of Derbyshire still have good water vole populations, recent monitoring by the Derbyshire Wildlife Trust indicates they may now be locally extinct in the Ecclesbourne. It is important to try to restore this special mammal to where good habitat still exists before we lose completely this important piece of our natural heritage.



White-Clawed Crayfish

These are the largest native freshwater invertebrates in the UK. They are shy, nocturnal creatures, easiest to see in shallow water during the evening. The population status in the Ecclesbourne catchment is not well known and could be very limited. Nationally, they are suffering huge declines, due largely to the arrival of the American signal crayfish. Signal crayfish are present in the River Derwent into which the River Ecclesbourne flows, making white-clawed crayfish extremely vulnerable in the Ecclesbourne catchment. In addition they are sensitive to changes in water quality and increases in fine sediment accumulation. All possible steps must be taken to minimise these pressures on our native crayfish and protect their dwindling populations (See page 17).

Pollution

One of the most serious problems facing the river is what goes into it. Excess nutrients and fine sediments find their way into the river from sources such as sewage outfalls and run-off from the land (See also pages 8 and 19).

Nutrients, primarily phosphates from sewage treatment works and agriculture, can lead to large growths of algae, which choke the river, limiting space and habitat for many animals and plants. Fine sediments can clog gravels, smother habitat, and reduce the amount of oxygen available to fish and invertebrates living or laying their eggs on the river bed. Decomposing organic matter from sewage or slurry can have devastating consequences for aquatic wildlife with populations of fish, crayfish, insect larvae and other invertebrates being depleted as a result.

These impacts affect the plants and wildlife of the Ecclesbourne at many levels. Impacts on the microscopic algae and invertebrates for example have a knock on effect on the fish and subsequently on the other important species, such as kingfishers, dippers and otters that feed on them. Otters are only a transient visitor, but improving the conditions for the other wildlife will increase the possibility of attracting them back on a more permanent basis.



Example of diffuse pollution.

Physical barriers

Over the last two centuries the industrial use of our rivers has left us with a legacy of weirs and other obstacles that block the annual upstream migration of spawning fish such as salmon and sea trout. Other freshwater fish, brown trout, grayling, and many course fish, are also impacted by such barriers as they too need to move up and down the river to reach good quality spawning habitat.

Efforts are underway to remove barriers to fish migration throughout the Trent catchment, which should then allow unrestricted access from the North Sea to the headwaters. The Ecclesbourne is one such headwater.

Four major weirs are present on the river and several minor ones on some of the tributaries. Some smaller weirs can be removed and the natural structure of the river restored, but for others a fish pass or fish ladder may be built to by-pass the obstacle.



Snake Lane Weir.

Invasive non-native species

The River Ecclesbourne, like many, suffers from impacts caused by invasive non-native species. These are animals and plants that do not occur naturally in the UK but have been imported into this country. Here, they often have a competitive advantage over native species by being free of natural predators or diseases that would normally keep them under control in their native range. As a result they proliferate, outcompeting native species for food, and habitat, and damaging the structure and integrity of river banks as they do so.

Such invasive species are estimated to cost the UK Government approximately £1.7 billion a year in direct costs. The wider cost to the environment is impossible to quantify.

The most problematic in the Ecclesbourne Valley are the Himalayan Balsam plant, American mink and the signal crayfish. The impact of invasive species can be limited by vigilance and perseverance, and in many cases this can be achieved with volunteers.

A non-native species volunteer network has been proposed for the Ecclesbourne valley that would see volunteers, landowners and fishing clubs working together to manage invasive species with the support of professional organisations like the Environment Agency and Derbyshire Wildlife Trust.

Invasive Non-Native Species (INNS)

It is now estimated there are almost 3,000 non-native species in Britain. Many of these don't cause any problems, but some inflict significant harm on our environment, economy and even health.

American Mink

Mink were originally imported for the fur trade. Now established in the wild, they prey on many British mammals and birds, and are partially responsible for the catastrophic decline in water voles over the last 30 years.



Signal Crayfish

North American crayfish species including the signal crayfish were first imported into the UK for food. They are now well established in the wild and carry a crayfish plague that has wiped out much of Britain's native crayfish populations. Invasive crayfish are slowly replacing our native species and have also been shown to have a negative impact on other wildlife including fish stocks (See page 15).

Himalayan Balsam

Himalayan Balsam escaped from Victorian plant collections and has since colonised river banks and woodlands throughout much of the UK. The main problem with this plant is that it outcompetes our native flora for light, food and space resulting in a loss of biodiversity. In some cases it is also responsible for choking waterways and increasing river bank erosion.



Japanese Knotweed

This plant was also introduced by the Victorians. Now established in the countryside, it is a common sight in many towns and is well known for its ability to damage the structural integrity of the river banks. It is notoriously difficult to eradicate, but this can be done with the right methods.

Actions - Wildlife

What	How	Who	When	Sources of Potential Funding
Fish passage.	Feasibility studies will be required to determine the types of solution.	The Environment Agency will lead through their fish passage scheme. They will work closely with partners, local landowners, fishing clubs and the community.	This work is ongoing with the removal of a number of major barriers predicted by 2015.	Environment Agency and Defra through the Water Framework Directive.
Monitoring and surveillance, including through the Meander Monitoring network (see Community section).	Monitoring activities would include: <ul style="list-style-type: none"> • General habitat surveys and river status • Otter and water vole surveys • River fly monitoring • Water chemistry 	The Environment Agency and Severn Trent Water will continue to deliver statutory monitoring. Derbyshire Wildlife Trust will work closely with community groups and schools to deliver the Meander Monitoring Programme (see community section).	Statutory monitoring work is ongoing. A local volunteer monitoring network will be established in early 2013. It is predicted that this will continue at least for a period of 10 years.	Environment Agency Catchment Restoration Fund Charitable Trusts Defra Local Business Small grant funding
Habitat and species restoration and protection.	This will involve: <ul style="list-style-type: none"> • Direct physical habitat restoration for the river • Improving light/shade balance where it is needed • Working with landowners to manage water protection • Removal and management of invasive non-native species 	The Environment Agency will lead landowner advisory visits with help from Natural England. The Partnership is working with volunteers from the local community and with landowners and fishing clubs to deliver positive restoration projects (see community section).	Advisory visits will commence in 2013 and some practical restoration work has already started. We want restoration work to be ongoing, but to last for at least 5 years.	Environment Agency Catchment Restoration Fund Charitable Trusts Defra Agri Environment Funding Local Business Small grant funding

Section 4 - Water Quality



● Location of Severn Trent Water treatment works in the valley.

The build up of nutrients specifically phosphate, is one of the main issues facing the River Ecclesbourne. Whilst nutrient enrichment is not always a particularly visible form of pollution, it directly impacts upon the ecology of the river, limiting its natural biodiversity (See also pages 7, 8 and 16).

Phosphate

Within the Ecclesbourne catchment, there are two principle sources of phosphate: treated sewage effluent, and what is termed 'rural diffuse pollution' which comprises run-off from fields.

Other sources include misconnections within the sewerage system; that is 'foul' sewage being inadvertently connected to surface water sewers or highway drains for example when house extensions are built. This can cause dirty water from a washing machine, dishwasher, sink and even a toilet to go straight into nearby streams and rivers.

Overflows within the sewer system can also cause phosphate pollution, which can become more frequent if the downstream system capacity becomes restricted due to a build up of fats and greases.



Wirksworth Sewage Treatment Works.

At the outset of this pilot project, an initial measurement of phosphorus was undertaken to identify the key sources in the Ecclesbourne Valley. This identified that approximately two thirds of the phosphate in the river was coming from sewage works discharges and the remaining one third was coming from diffuse sources (See text box page 8).

Effluent treatment

As the single largest source of phosphorus entering the river was from the largest sewage works serving Wirksworth, Severn Trent Water commissioned a pilot plant to reduce phosphorus levels in the treated effluent. This trial work commenced in May 2012 and has succeeded in reducing phosphorus concentrations

at Wirksworth by 75 percent, and reduced the overall quantity of phosphorus entering the river via all sewage works from 9.1 kilograms per day to 4.3 kilograms per day.

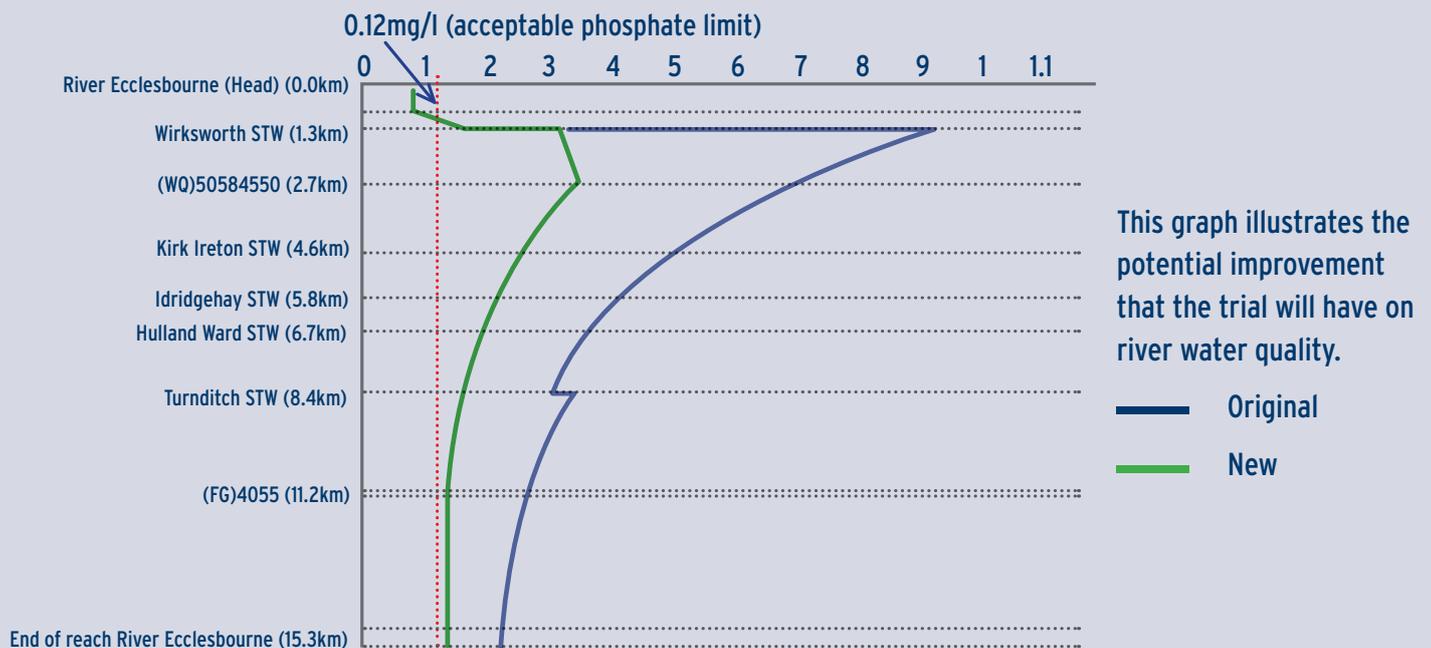
Whilst the work done to date has moved us closer to our water quality objective, there is still further work to be done to meet our target.

Legislative changes will ban the use of phosphate in laundry products from June 2013 and also in dishwasher tablets from January 2017, which will result in an estimated 20% reduction in phosphorus discharges from the other four sewage works in the valley catchment.



Waste Water Treatment.

Phosphate Concentration



Actions - Water Quality

What	How	Who	When	Sources of Potential Funding
Ensure that the requirement to remove phosphate from Wirksworth sewage treatment works is captured within existing environmental planning activities documentation.	<ul style="list-style-type: none"> • Include in Water Framework Directive River Basin Plans • Include in Severn Trent Water's capital investment plan (PR14) 	Environment Agency & Severn Trent Water	2015 - 2020	Through PR14 OFWAT price review mechanism.
Phosphate removal trial at Wirksworth sewage treatment works.	Through chemical treatment of the effluent coming out of the works.	Severn Trent Water	2012 - 2013	Already in place (Severn Trent Water operating budget).
Upgrade Hulland Ward sewage treatment works (whole works replacement). Refurbishment of tertiary reed beds at both Turnditch and Ildridgehay sewage treatment works.	Through Severn Trent Water's capital investment process.	Severn Trent Water	2012 - 2014	Already in place (Severn Trent Water capital budget).
Investigate impact from private sewage treatment works in the catchment and offer advice on operation/maintenance.	Combination of site visits, sampling and flow measurement.	Environment Agency & Severn Trent Water	2013	Through Severn Trent Water / Environment Agency operating budgets.
Review operation of sewer overflows (designed to operate during periods of exceptionally heavy rainfall) in Wirksworth area and quantify impact on water quality.	Visual inspections & sampling/modelling (would be part of wider Water Framework Directive investigative work).	Severn Trent Water	2013 - 2020	Through Severn Trent Water operating budget and PR14 price review.
Review of effluent discharged by businesses to the sewers (consented trade effluent discharges).	Through visits to business premises and completion of risk assessment.	Severn Trent Water	March 2013	Through Severn Trent Water operating budget.

Section 5 - Access, Recreation and Tourism

A prosperous rural economy is essential to the economic and social life of rural communities. Promoting the countryside as an attractive setting for recreation is an important factor in the mindset of those placed to deliver landscape, access, and

conservation improvements within the valley. The development of countryside access can help to deliver sustainable rural tourism, which in turn provides economic benefits for the whole of the rural community.



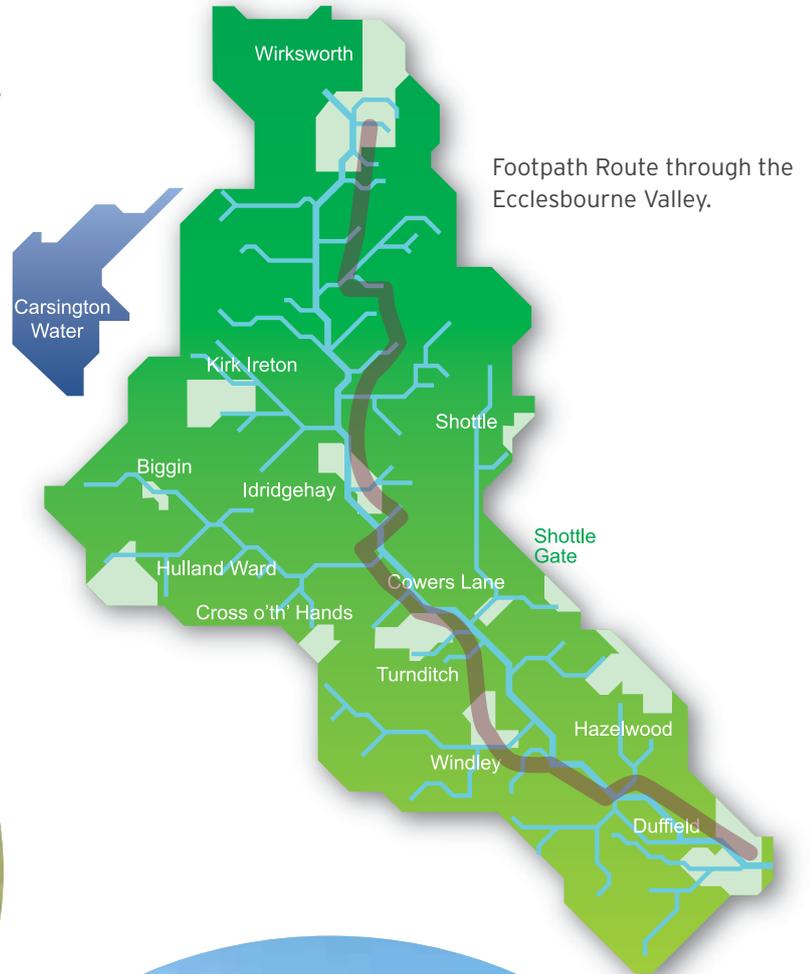
Ecclesbourne Valley Railway, Wirksworth Station and goods yard.

Rural economy

The countryside is generally in private ownership, and managed largely by the farming community, essentially for economic purposes. The viability of an agricultural community, sympathetic towards conservation and access objectives, remains fundamental to the management of much of the countryside. The quality of the land has a major impact upon river quality.

Development of tourism

The development of recreation and tourism within the catchment can help deliver opportunities for farm diversification (bed and breakfasts, farm shops, livery, fishing, rough shooting, cafes, etc) and contribute positively towards the viability of farm businesses. It can also help preserve heritage buildings by finding alternative uses.



Footpath Route through the Ecclesbourne Valley.



An Amber Valley Tourism Economic Impact Assessment carried out in 1997/98, found that 2.6 million visitors came to Amber Valley that year - 2.4 million as irregular day trippers and 0.2 million as overnight visitors. Around 784,000 of those came to visit the countryside and spent on average around £12.62p per head (c£9.9 million).

It is not difficult to see the financial contribution that the countryside access makes to the rural economy. Similar studies undertaken at the time of the last foot-and-mouth outbreak, confirmed the growing economic importance of countryside recreation.

Actions - Access, Recreation and Tourism

What	How	Who	When	Sources of Potential Funding
Develop a medium distance route for walkers between Duffield and Wirksworth.	Survey and produce self-guided leaflets in partnership with landowners/interest groups.	Derbyshire County Council Volunteers Amber Valley Ramblers Partners	For 12/13 year	Natural England paths for communities. Heritage Lottery Funding
Develop self-guided circular walks off the spinal route linking rural communities.	Survey and produce self-guided circular walks in partnership with landowners and local interest groups.	Derbyshire County Council Volunteers Amber Valley Ramblers Partners	2013/14	Natural England paths for communities. Heritage Lottery Funding
Develop links with local volunteers to help deliver the above activities.	Contact local interest groups to establish programme.	Derbyshire County Council Countryside with partners.	2013/14	Natural England paths for communities. Heritage Lottery Funding



Section 6 - Flood Management

Like any river valley, the Ecclesbourne has experienced flooding in the past and inevitably flood risk will continue to be an issue at certain locations in the future. This would happen regardless of any impacts due to a changing climate, but when this is also considered, it becomes clear that flood risk will increasingly become more of an issue.

The latest scientific opinion suggests that for the East Midlands, with a moderate increase in greenhouse gases, there could be a five percent increase in winter precipitation, and up to an eight percent decrease in summer precipitation between 2010 and 2039. Generally it is predicted that climate behaviour is likely to be more erratic than at present, so adapting to these changes is of vital importance.



Flooding at Snake Lane Weir.

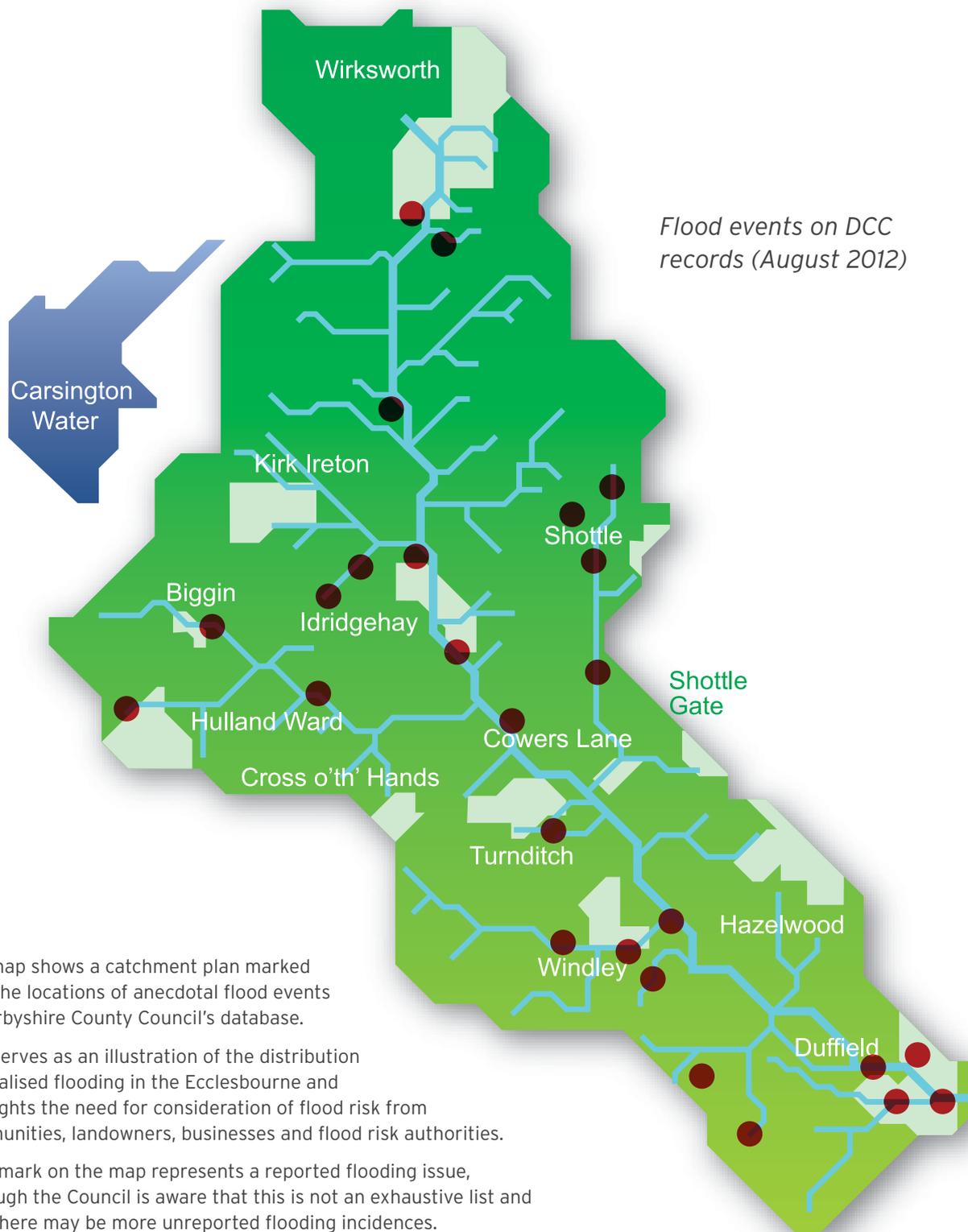
Lead Local Flood Authority

Derbyshire County Council became the Lead Local Flood Authority in 2010 and has an overarching responsibility for coordinating flood risk management in the county. The Council are responsible for the flood risk management of surface waters, ground waters and what are termed 'ordinary' watercourses, which cover most of the Ecclesbourne Valley upstream of the Nether Lane Wirksworth Road junction north of Duffield.

Ordinary watercourses include every river, stream, ditch, dyke or any other passage through which water flows that is not designated as 'main river'. Main rivers are a set of primary watercourses designated as such by government. These are often,

although not exclusively, the larger streams and rivers (See page 27).

Derbyshire County Council will be working closely with residents, land owners and businesses within the county, including the Ecclesbourne Valley, upon completion of Derbyshire's Local Flood Risk Strategy. You can help the County Council by making them aware of flooding issues concerning ordinary watercourses. More information on this as well as the Council's role as Lead Local Flood Authority for Derbyshire can be found on the Derbyshire County Council website.



The map shows a catchment plan marked with the locations of anecdotal flood events in Derbyshire County Council's database.

This serves as an illustration of the distribution of localised flooding in the Ecclesbourne and highlights the need for consideration of flood risk from communities, landowners, businesses and flood risk authorities.

Each mark on the map represents a reported flooding issue, although the Council is aware that this is not an exhaustive list and that there may be more unreported flooding incidences.

Flood risk and flood warning

'Main' rivers are regulated by the Environment Agency, which is the coordinating body for any flood defence works and flood risk management issues occurring on these rivers.

Below the Nether Lane/Wirksworth Road junction the River Ecclesbourne is classified as 'main' river and flood risk is managed by the Environment Agency. In the lower part of the valley around Duffield there are 857 properties in flood zones 2 and 3 that are covered by a flood warning facility (See below).

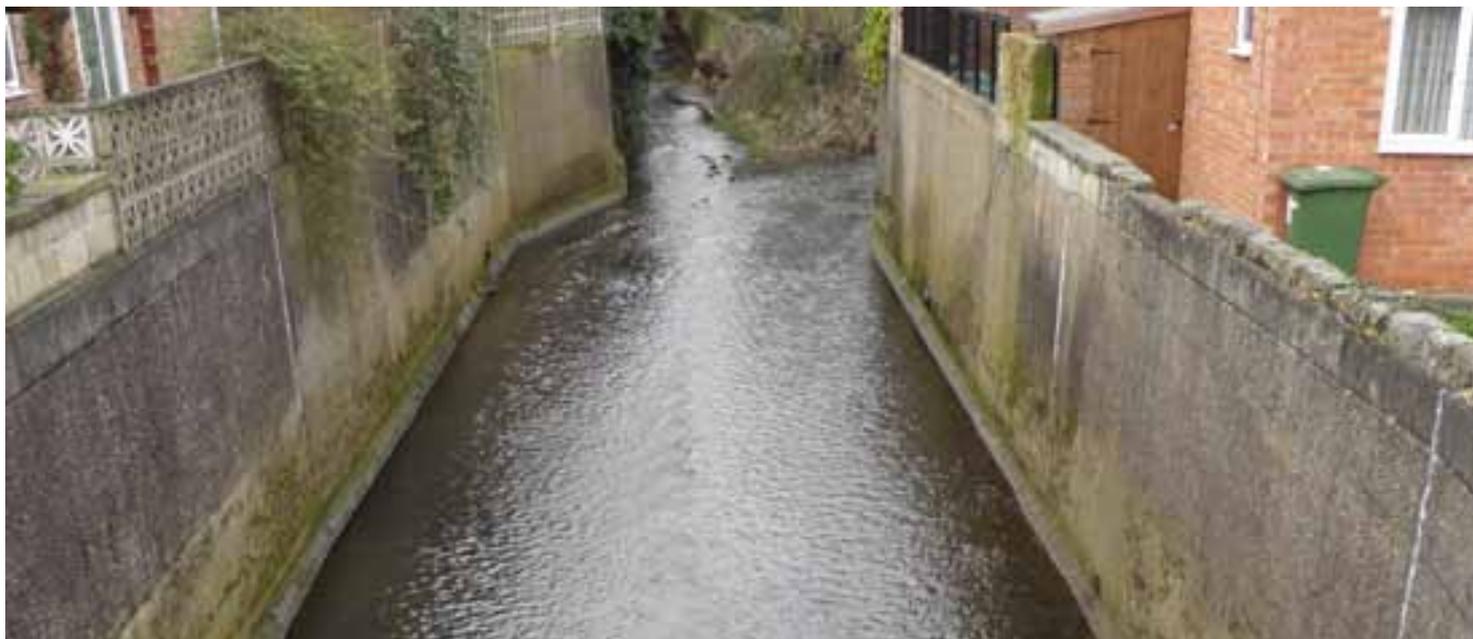
The Environment Agency has a river level gauge on the River Ecclesbourne, at the point where it becomes main river. It aims to offer two hours notice of when flooding of property is expected to

occur, however so far it has not had to issue such a warning.

To protect against flooding, water is passed down a large concrete channel through the centre of Duffield. This is effective in moving water fast through the town but has limited value for wildlife, and has to be cleared out every 15 years to maintain its capacity.

Despite the fact that no flood warnings have been issued so far, a changing climate is set to exacerbate things with wetter winters increasing the risk of flooding and dryer summers impacting on more wildlife.

The River Ecclesbourne as it flows through the centre of Duffield.



Flood warning

The Environment Agency provides a flood warning service for 867 properties in Duffield from the River Ecclesbourne. Using the latest available technology, Environment Agency staff monitor rainfall and the levels at the gauge upstream of Duffield on the River Ecclesbourne 24 hours a day, and use this information to forecast the possibility of flooding. The Flood Warning service covers properties in Flood Zone 2 and 3. If flooding is forecast, we issue 3 main types of flood warning:

- **Flood Alert - Flooding is possible. Be prepared.**
- **Flood Warning - Flooding is expected. Immediate action required.**
- **Severe Flood Warning - Severe Flooding. Danger to Life.**

The Environment Agency aims to offer two hours notice of when they expect flooding of property to occur in Duffield.

To register to receive the Flood Line Warning Direct, please call Floodline on: 0845 9881188 or visit: www.environment-agency.gov.uk

(Please note that there are no flood warning areas for any properties upstream of Duffield.)

A floodplain is the area that would naturally be affected by flooding if a river rises above its banks. Flood Zones are separated into three areas, Flood Zones 1, 2 and 3.

Classifications are as follows:

Flood Zone 1

This is land outside the floodplain where there is a less than 1 in 1000 years (0.1%) chance of flooding from either river sources or from the sea in any one year.

Flood Zone 2

This is the low to medium flood risk zone and covers all land where there is between a 1 in 100 (1%) and 1 in 1000 (0.1%) chance of flooding from rivers in any one year.

Flood Zone 3

This is the high risk zone covering all land where there is a 1 in 100 years (1%) or greater chance of flooding from rivers in any one year.



Careful upland management can help reduce flood risk further downstream.

Land management

Good land management can reduce flood risk by slowing runoff and reducing flood peaks, as well as having benefits for water quality. The Lower Derwent Flood Risk Management Strategy identifies the land management approach as a way of adapting to a changing climate. Changes in land management mean working with natural processes to reduce flood risk and improve water quality.

This could include woodland planting and management; meadow restoration; planting of buffer strips; and the creation of woody debris dams. All of these aim to reduce run-off and/or diffuse pollution.

The Forestry Commission have welcomed our proactive approach

to delivering land management change, and see this as a real opportunity to demonstrate how this partnership approach can be effective in making a difference to the water environment. There is strong evidence from the research arm of the Forestry Commission that small scale catchment land management approaches of this type can deliver cumulative flood risk benefits by reducing and delaying the flow of water downstream.

Local residents, landowners, businesses and authorities all have a key role to play in managing flood risk in the Ecclesbourne valley, and many flood risk management actions are simply and cheaply implemented.

Actions - Flooding

What	How	Who	When	Sources of Potential Funding
Getting properties at flood risk to sign up for Environment Agency Flood Warnings.	Communications, leaflets, flood fairs and events.	Environment Agency.	Continuous	Environment Agency.
Promotion of flood risk sensitive approaches to land management and farming.	Through Environmental Stewardship scheme and other communication.	Natural England and Derbyshire Wildlife Trust.	Continuous and ongoing.	Environment Agency and partners.
Install small scale wooden dams, woodland planting, and balancing ponds, etc to slow down the flow of water.	Derwent Land Management Project.	Environment Agency.	2012 - 2013	Environment Agency and partners.
Keeping private watercourses and land drains clear and in good working order.	Good maintenance.	Riparian (riverbank) owners of watercourses.	Immediate with community engagement.	Land owners.
Promotion of more natural drainage systems(Sustainable Drainage Systems - SuDS) to reduce pressure on current drainage systems from new development.	Through the SuDS Approval Body (SAB), when commenced.	Derbyshire County Council - The SuDS Approval Body (SAB).	Ongoing	Derbyshire County Council.
Improving communications between Environment Agency and Derbyshire County Council on planning applications with flood risk implications.	More routine dialogue between two authorities to discuss planning applications.	Environment Agency and Derbyshire County Council.	2013	Environment Agency and Derbyshire County Council.
Implementation of Derbyshire County Council's gully cleansing project which aims to better inform which gullies have regular debris/ sediment blockages and need attention more regularly.	Gully Cleansing Scheme being rolled out at present.	Derbyshire County Council Highways.	2013 - 2016	Derbyshire County Council.

Conclusion - The Way Forward

The Ecclesbourne valley was chosen as one of the first catchment based initiatives by Defra, to consider whether a collaborative approach could be an effective method to protect and improve the health of our water environment. Overall the pilots were chosen for their variety, so that new ways of working could be applied to a wide range of scenarios.

This plan captures the actions that the Ecclesbourne Restoration Partnership has identified during the initial pilot phase, over the last fifteen months. Some have already been delivered, some rely on obtaining funding in the future, and others are being taken forward by the respective partners. In order to continue to deliver these positive actions, the partnership has decided to extend its activities beyond the end of the pilot phase which concluded in December 2012.

The Environment Agency will continue to host the partnership two to three times a year focussing on delivering 'Our Vision' as highlighted at the start of this document. The partnership will:

- Review achievements against the action plans
- Seek opportunities for further funding through partnerships to enable further actions to be delivered
- Strive to achieve good water quality and raise awareness of the river and its surrounding environment as set out in 'Our Vision'
- Be open to new partners and those who have the potential to be involved.



How can you get involved?



We can't do this on our own.

We also need to work with landowners, farmers and local communities to help this valley achieve its full environmental potential.

It's your environment and we want to know whether you have ideas that you would like to develop through the partnership to improve the river and its catchment.

- Are you part of a community group that would like to be involved in any future work along the river?
- Are you a farmer or landowner who is willing to improve your riverside land for wildlife and benefit from agri-environment grants?
- Is your school interested in being involved in a wildlife project linking to the national curriculum or carrying out a clean up on the river?

There are likely to be a range of activities and events in the coming months, which will be publicised on the website:

www.derbyshirewildlifetrust.org.uk

If you, or a group that you belong to, are interested in becoming involved in any future projects associated with the river, please contact the Ecclesbourne Restoration Partnership on the email address below:

comms_east@environment-agency.gov.uk

Or call the Environment Agency on:
Tel: 03708 506 506



