

# Idle Catchment Partnership Action Plan



Environment  
Agency



Nottinghamshire



Working together  
for a better water  
environment



# Our Vision for the Catchment

## Our Shared Vision for The Idle Catchment

To conserve and enhance the Rivers Idle, Ryton, Poulter, Meden, Maun, their tributaries and surrounding land, to create a healthy and wildlife-rich water environment for the benefit of both people and biodiversity.

### Foreword

'Fed by the Rivers Ryton, Poulter, Meden, Maun and Rainworth Water, the River Idle flows in the shape of an inverted question mark north through Retford, under the Chesterfield Canal, nudging the old port of Bawtry, negotiating the hill at Gringley and encircling Everton, Gringley and Misterton Carrs before discharging into the Trent at West Stockwith. With the entire catchment covering 340 square miles and a population of over 250,000 dependent on the water courses, it is clear that there are considerable pressures on the water resource.

The reputation of the River Idle is bound up in its name – it is Idle both by name and nature, flowing gently over its last five mile section so flat there is a fall of less than 1:1,000. Prior to reaching its heavily engineered pumped outfall the river and its tributaries navigate a path from and through many urban areas, historic ducal houses and important wetland areas, as well as the last remaining area of the ancient Sherwood Forest, providing a natural boundary to several traditional village settlements and draining swathes of productive agricultural land.

It is important to protect and enhance the health of the rivers, including their surrounding habitats, biodiversity, water quality, productive capacity and the welfare of those who live within its embrace. Predictable and moody as the rivers are, people are not always inclined to treat them with respect – intensive land management and pollution have taken their toll on the catchment's well being, although the decline in ecological status and water quality in relatively recent times is being addressed and in some ways effectively reversed.

The Idle Catchment Action Plan has been established to achieve this, and to raise the awareness of the rivers and their environment amongst those who live and work in the catchment and whose lives are affected by their closeness to them. It is designed to make the most of the role of the local communities to deliver environmental, agricultural and social improvements through collaboration, education and ground work.

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

Tim Farr, Chair of the Regional Flood and Coastal Committee

# Background

Image: David P

## Background to the Idle Catchment

The Idle and Torne catchment covers a wide geographic area, spanning multiple districts, 4 Counties and 2 regions. Due to the range of complex issues and competing priorities in the area, it seemed appropriate to split the catchment into two sub-catchments based on the two rivers. A separate steering group has been set up for the Torne, hosted by Yorkshire Wildlife Trust.

The sub-catchment includes the following rivers and their tributaries;

Meden, Maun, Poulter, Rainworth Water, Vicar Water, Ryton and of course the River Idle itself. These drain over 879km<sup>2</sup> (1) of the surrounding land. Much of this area is rural, although it does cover some major urban areas including Mansfield (pop. c.100,000), Worksop (pop. c.40,000), Sutton in Ashfield (pop. c.42,000) and Retford (pop. c.21,000).



Image: Sean Browne

The large area and the mix of urban and rural land uses create a diverse range of pressures on the water catchment, including:

- Urban point source pollution from areas of industry and housing, misconnections etc
- Phosphate and nitrate inputs from waste water treatment works
- Rural point source and diffuse pollution
- Heavily modified channels
- Low flows in some watercourses
- Flooding risk from many watercourses
- Over-abstracted aquifers
- Groundwater pollution
- Widespread loss of riparian marginal habitats
- Degraded riverine fauna
- Presence of invasive non-native species

### Point Source/Diffuse Pollution

Point source pollution is where the contaminants are coming from a single point – such as a waste treatment works (WTW), or from a factory.

Diffuse pollution is from a much wider source, such as an area of farmland or from a housing estate.

# What is the Catchment Based Approach?

Image: Thornypup

A shift in thinking led the UK government to realise that looking at smaller water catchment areas rather than large river basins was a positive step in achieving improvements to water bodies and their associated environment, and towards achieving the targets of the Water Framework Directive (WFD). This led to the introduction of the 'catchment based approach' by DEFRA (Department for Environment Farming and Rural Affairs) to enable local stakeholder groups to promote the protection and improvement of the water environment.

*On World Water Day (22 March 2011), Richard Benyon, Minister for Natural Environment and Fisheries, announced that to bring about genuine improvements to the water environment we 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.'*<sup>(2)</sup>

The objectives for the Catchment Based Approach are<sup>(3)</sup>:

1. To deliver positive and sustained outcomes for the water environment by promoting a better understanding of the environment at a local level;

and

2. To encourage local collaboration and more transparent decision-making when planning and delivering activities in order to improve the water environment.

## What is the Water Framework Directive?

The Water Framework Directive (WFD) is a piece of EU legislation which was adopted in 2000. Its main purpose is to protect inland, coastal and groundwater's and to ensure that all waterways reach either good ecological status, or where this is not possible, good ecological potential, by 2027.

The status of the water is assessed using the following criteria

- Biological quality (fish, invertebrates and aquatic flora)
- Hydromorphological structure (river bank and bed structure, continuity)
- Physio-chemical quality (dissolved oxygen, temperature, nutrients)
- Chemical quality (phosphates and other pollutant levels)

If a water body is found to fail on just one aspect of this, then it will fail to meet the required standards.

A large part of the Catchment Based Approach is the promotion of ownership of the water on a local level, with communities and landowners being involved in decision making and project leadership.

# What are the problems facing the Sub-Catchment?

Under the WFD, problems that are identified as causing the failures as described are called "Reasons for Failure".

The principal Reasons for Failure (RFF) currently facing the Idle sub-catchment are as follows:

1. Pollution from waste water, particularly discharges from sewage treatment works and mines.
2. Pollution from rural areas, predominantly, mixed agricultural run-off.
3. Physical modification of the river, mainly historically for land drainage.

In addition, the catchment has serious problems to resolve with regard to groundwater over-abstraction and pollution, urban run-off, barriers to eel, coarse fish and salmonid passage, and tensions around flood defences and the protection of farmland.



## Phosphates

Phosphates are a group of inorganic compounds which contain phosphorus. They are found within fertilisers and detergents and contribute greatly to pollution levels in water. They quickly contribute to increased nutrient levels, which in turn cause algal blooms in rivers and lakes which drastically reduces the amount of dissolved water, and therefore prevents other aquatic life from surviving.

# The Action Plan

Image: Rob Pettifer

The aim of this document is to look at 5 different areas, which were identified through stakeholder engagement, where we would like to make a positive difference to the water environment.

1. Farming
2. Nature
3. Community
4. Industrial and Urban
5. Water Management

This plan should be read in conjunction with the catchment priorities map which details priorities identified during two stakeholder workshops held in December 2013, and from follow up consultation. The map is a working document which will be updated as and when new projects are identified and current projects are



Image: Jeff Smith

# Farming

In recent years, many farmers have made serious efforts to reduce pollution into watercourses from their farms, not least because it makes good business sense not to waste valuable resources such as fertilisers. There are however, several water quality issues which can be associated with agriculture and many of these can be lessened through simple measures.

There are 511 farms within the sub-catchment boundary, all of which have the potential to impact on the water environment. One of the main sources of agricultural pollution can be high phosphate levels through run-off from fertilisers. By simply leaving a wide unploughed buffer strip with permanent vegetation cover along a watercourse, the loss of this essential resource can be dramatically reduced. Targeted use of fertilisers can also play a part in reducing their use and the potential for run-off into the watercourse.

Poaching from livestock, particularly cattle, can lead to increased levels of silt in the water body which will reduce the spawning suitability for certain types of fish, particularly salmonids. The silt can often also contain Phosphorus and Nitrogen, thus worsening the chemical pollution of the river. This again is easily solved through the introduction of constructed cattle drinkers, or by using pasture pumps. Other simple changes, such as contour ploughing, careful siting of slurry stores and manure heaps and moving feeders and water troughs regularly, can all help to reduce pollution inputs.

Many of the watercourses within the catchment are managed by the Environment Agency (EA) but there are also a large number which are managed by Internal Drainage Boards (IDB). IDBs have a duty to maintain these watercourses to allow water passage and water levels to be maintained. Increasingly they are also interested in enhancing their channels and improving them for biodiversity gains and leaving wide margins/ buffer strips can prove effective in improving water quality. In addition, Local Authorities now also have a part to play as Lead Local Flood Authorities responsible for developing, maintaining and applying a strategy for local flood risk management in their areas. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and ordinary watercourses.

## Livestock Drinking Bays

The aim of a livestock drinking bay is to allow livestock to drink from a watercourse, while preventing them from standing in the water. They consist of an access ramp excavated into the bank with a three sided perimeter post and rail fence. The size of the drinking bay depends on the type, size and number of livestock involved.

To construct an access ramp, soil should be excavated to a depth of not less than 150 mm or down to a naturally occurring hard surface, the depth of which will vary according to the type of ground. The excavated soil should be spread and profiled in the immediate area.

A hardened surface with a minimum depth of 150 mm and consisting of compacted hardcore, scalplings or locally produced shale should prove sufficiently robust to withstand regular livestock movements, prevent poaching and reduce the amount of sediment from entering the stream. At the water's edge, some form of kerb (e.g. 100 mm x 50 mm pressure treated timber) must be in place to prevent the gradual 'creep' of hardcore/scalping into the watercourse.



Installation costs are in the region of £150-£200 dependent on the size of the drink and the availability of machinery.

It is important that a drinking bay is used in conjunction with additional fencing along the watercourse to prevent livestock accessing the banks in other areas.

# Farming Actions

Image: Olivia Massi

Image: Susanna Bird

Many of the identified projects relate to sediment inputs, something which through fencing and managed cattle drinks can be dramatically reduced. Another aspect which has been raised is the need for further education of farmers about WFD and its implications and for funds to help farmers with the capital costs of interventions.

## The Way Forward

- Increasing awareness amongst farmers on diffuse pollution issues, including cost effective solutions.
- Highlighting the aims of the catchment partnership project and opportunities for involvement.
- Helping farmers to find financial and/or technical support to achieve WFD targets.

## How will this be achieved?

1. Funding will be sought to enable fact sheets to be produced and to fund officer time to engage with farmers; through farm visits, on-farm demonstrations and at farming events (e.g. Ploughing Matches).
2. Funding to be sought to allow small scale grants to be made to farmers and riparian land owners to tackle WFD issues i.e. to build cattle drinkers and create buffer strips.
3. Promotion of Best Farming Practices through the National Farmers Union and Campaign for the Farmed Environment.

## Tram Line Management

Tram lines within fields are usually the areas with the highest amount of compaction and can lead to an increase in water run off, phosphate and sediment loss. Use of correctly inflated low ground pressure tyres can help to reduce these impacts but in addition recent research has shown that losses can be significantly reduced by the use of harrows attached to the back of the sprayer<sup>(10)</sup>. These disrupt the ground surface, slowing down the passage of water.

## Minimum Tillage

The introduction of a minimum tillage system has been shown to reduce surface water run-off as well as sediment and pollutant inputs into river systems. In addition, there are other benefits such as a reduction in labour and fuel costs which are provided by this system.

## Contour Ploughing

Ploughing across a slope in line with the natural contours of the field, is known to reduce the formation of rills and gullies during periods of heavy rainfall, by creating water breaks. Not only will this decrease soil erosion and sediment run-off, it will also increase the volume of water which soaks into the ground.

## Buffer Strips

Leaving a strip of land uncultivated adjacent to watercourses and ditches helps to slow the passage of water, reducing the loss of soil and nutrients into the watercourse. If possible a minimum of 6 metres (in addition to the 1-2 metre cross-compliance zone) should be left. This area should also be subject to minimal compaction in order for the maximum benefits to be provided.



# Nature

Image: Graham Shaw

The Idle and its tributaries support a wide variety of wildlife, including protected species such as white-clawed crayfish, otters, water vole, Daubenton's and soprano pipistrelle bats.

In addition species such as kingfishers, black darter and hairy hawk dragonflies, harvest mice (which are heavily reliant on reeds), water shrew, as well as wintering whooper swans and breeding avocet, rely on the waterways and bankside vegetation within the catchment.

The River Idle is very important for fish, playing host to species such as barbel, bleak, brown trout, bullhead, chub, common and silver bream, carp, dace, eel, gudgeon, perch, pike, roach, rudd, tench and minnows. Internationally eels are suffering from huge declines, so ensuring that they can continue to breed in the Idle is incredibly important.

There are many pressures on wildlife and habitats in the sub-catchment, including:

- Channel modification
- Poor water quality (both chemical and physical)
- Loss of habitat through vegetation clearance
- Low flows
- Barriers to fish passage
- Invasive non native species

Many watercourses, particularly those running through urban areas and farmland, have been heavily modified. Whether this is through hard engineering of channels, or through straightening (with the subsequent loss of meanders, backwaters, and natural features such as riffle-pool sequences, berms and gravel shoals) it still leads to a lack of

habitat and flood plain connectivity. Often this modification took place to increase drainage and 'prevent' flooding, whilst in reality this normally has the effect of relocating the problem further downstream.

Another problem created by physical modification can be the fragmentation of different populations, for instance preventing the movement of crayfish to different areas of a river. It can also prevent the passage of fish and eels to their spawning grounds, leading to declines in population numbers. Physical barriers can however also work in favour of declining species; there is a population of native white-clawed crayfish in the Cauldwell Brook which are effectively separated from potential invasion of the American signal crayfish by hard engineering in Mansfield.

A lot of research and practical work has been taking place to restore river channels to a more naturalised state and many of the principles behind this will provide additional WFD benefits, by improving habitat for fish, invertebrates and other wildlife, reducing flooding, improving flows, and improving the chemistry of the water through increased dissolved oxygen and decreased nutrient levels.

There are also problems with low flows in the catchment, particularly around Rainworth Water and Vicar Water, which may be a legacy from mining in the area. There are currently investigations taking place with various interested parties looking at the causes of this and possible solutions. In areas of low and intermittent flows, there can be a lot of problems for wildlife, especially fish and aquatic invertebrates which rely on constant flows for some or all of their life stages. If the flow disappears then this can lead to local extinctions of some types of wildlife.

# Invasive Non Native Species

'An Invasive Non Native Species (INNS) is described as any non native animal or plant which has the ability to spread causing damage to the environment, the economy, our health and the way we live' <sup>(7)</sup>. The INNS which are present within the catchment are detailed below. This does not include all the INNS in the UK, some of which have the potential to move into the sub-catchment. For instance the American signal crayfish is already present in Southwell and in Nottingham, which could allow it to colonise other waterbodies locally.

Chinese Mitten Crab (so called because of the dense fur on their claws) are on the list of the 100 most damaging invasive species in the world <sup>(4)</sup>. They cause damage to banks and vegetation, modifying the river habitat and competing with native species for habitat and resources. Known to be in the River Idle, this species could cause extensive problems if it spreads further. There is currently no form of control.

Japanese Knotweed was introduced to the UK by the Victorians as an ornamental plant and has done very well, outcompeting native plants. It can grow up to one metre in a month and is so strong that it can break through concrete, making it very good at destabilising riverbanks. The plant can regenerate from the crown, stem or rhizomes which is why it is so pervasive. The most common way to control the plant is by repeated chemical treatment.

Himalayan Balsam is another plant which was introduced in the 19th Century and which spreads rapidly along rivers and streams. It grows quickly and outcompetes other plant species but its complete die back in winter, leaving bare banks and allowing erosion to occur, causes the greatest problems. The main form of management is to hand pull before the seeds are ripe, which is very time intensive and requires lots of volunteers! Currently there is co-ordinated work taking place on the Maun and the Meden, with ad-hoc work elsewhere.

*Crassula helmseii* is present in lots of ponds and lakes, and in some slow moving waterbodies. It outcompetes native vegetation and can create mats fifty centimetres thick reducing dissolved oxygen and smothering the waterbody, killing fish and aquatic invertebrates. It is

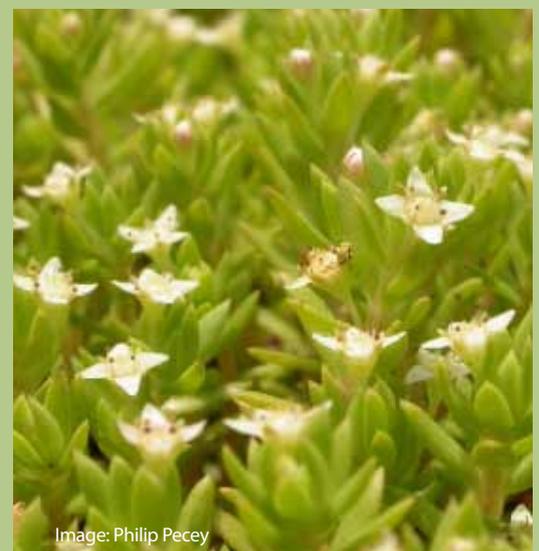


Image: Philip Pecey

# Invasive Non Native Species

Image: Darin Smith

possible to control *crassula* by manually removing it in the early stages, or by chemical treatment. A novel new approach has been developed which involves a process called foamstream<sup>(5)</sup> where heat is applied to the plant in the form of steam, foam and hot water which smothers the plant.

Giant Hogweed is a very large plant which can grow to six metres in height, casting large amounts of shade over anything which tries to grow beneath it. It grows vigorously, outcompeting native plants and causing riverbank erosion when it dies back in winter, additionally its sap is phytotoxic, causing blistering and burning to skin. The best option for control is spraying with glyphosate when the plant is less than a metre tall.

*Azolla* is a small water fern which was introduced as an ornamental pond plant and has now spread into the wider environment. It forms thick mats, deoxygenating ponds and blocking sunlight from reaching into the waterbody. It can look like grass and has been attributed to cattle drownings, after being mistaken for a grass covered field. It likes slow moving waterbodies, grows rapidly and at optimum conditions can double in two days. It also causes nutrient problems as it fixes nitrogen from the air and it can be a particular problem in areas with high phosphate content. It is possible to control this plant by manual and chemical means but research has been focussing on the use of a native weevil which can be released into affected areas. This has been shown to have dramatic effects in reducing coverage in the Grantham Canal, Nottinghamshire<sup>(6)</sup>.

American mink have been released into the wild through fur farms and are now fairly widespread throughout the UK. They cause significant damage to natural ecosystems by preying on water voles and other small mammals, in addition to water fowl and their young. Regional and local efforts to control mink have taken place, with efforts concentrated on localised capture and dispatch. Future efforts could focus more on making habitat unsuitable for mink and more suitable for otters. Otters are making a come back in Nottinghamshire and outcompete mink when populations reach a sufficient level, so may be a more effective method of control.



Image: jaco Visser



Image: Ulf Gotthardsson

# Nature Actions

Many of the priorities reflect the high levels of INNS in the sub-catchment, particularly Himalayan Balsam, and the need for greater control over these species is clearly important to many people. A large number of the projects already identified relate to reconnecting habitats and the flood plain, removal of hard engineering, removing barriers to fish passage and renaturalising the river channel. However, it is clear that a large amount of work needs to take place to identify habitat and connectivity projects before they can be prioritised and implemented.

## The Way Forward

- Increase the level of work taking place to tackle INNS.
- Investigate low flows in the catchment.
- Distribute literature to land owners and managers on good practice in managing rivers and associated habitats for wildlife.
- Promote the use of alternatives to hard engineering to local authorities and developers.
- Conduct walk over surveys of each water course to identify potential habitat enhancement/river restoration projects.

## How will this be achieved?

1. Funding to be sought to support Nottinghamshire Biodiversity Action Group (BAG) to increase the work they are currently doing to co-ordinate INNS removal and reporting across the catchment.
2. Existing literature on riparian management to be made available and distributed throughout the catchment.
3. Current EA investigations into low flows to continue.
4. Creation of a funding group to conduct walk over surveys and look into potential sources of funding for river restoration and enhancement projects and to prioritise projects within the catchment.
5. Training sessions to be delivered to planners, developers and local authorities to cover WFD,

## Large Woody Debris

Derbyshire County Angling Club have been instrumental in working on the Idle to install large woody debris within the channel. The trees (preferably silver birch as willow tends to reroot very rapidly preventing access along the channel) are attached using wire rope which is either attached to steel pegs or a tree stump if one is available.

Putting these structures into the water creates pinch points, increasing the flow of water. In time this will scour the river bed, removing silt and exposing gravel, making it more suitable for fish spawning and for invertebrates. The area behind the trees create a backwater, ideal refuge areas for fish and invertebrates but also slower areas where silt can be deposited. This in time will help to renaturalise the river, by creating more permanent pinch points.



Image: Ron Trevis

## Spiling

Willow spiling is a traditional technique used to protect eroding banks, with willow stakes driven into the riverbed and live willow woven in between. The area behind the willows is then infilled with soil to provide a medium for the willow to root into, stabilising the bank.

This technique has been successfully employed on the River Idle, providing additional habitat whilst effectively protecting the banks from further erosion. The photo below shows spiling which has successfully re-rooted.



# Community

Communities use rivers in a variety of ways, as a resource for providing clean water, as a place for recreation, and in some areas as a means of transportation – for both goods and people.

The use of rivers by people as a place to relax, watch wildlife and undertake sports has been taking place for many hundreds of years. This can place undue pressures on the waterway, and its associated wildlife, but this can be managed to improve the area. Dog walking can provide pressures by dogs running off the lead, disturbing ground nesting birds, and entering rivers and disturbing silts and gravels. Boating and other water sports can present their own problems, getting too close to bankside vegetation or creating a wash which disturbs reeds can lead to water inundating the nests of birds such as the reed warbler, and small mammals like the harvest mouse. Banks can be damaged, either through inexperienced piloting of vessels, or inappropriate areas being used to launch boats into the water resulting in bank slippage and an increase in sediment load. For larger motorised craft there can be problems of point source pollution, such as oil and septic tank leaks.

There are many ways in which the local community can be involved in protecting and enhancing the Idle and its tributaries, but this often needs to start with education. Many sources of urban pollution can be traced back to misconnections in household water supplies – connecting waste water pipes up so that they flow into surface water drains instead of waste water drains. This then takes phosphates, oils, fats etc straight into local water courses instead of to a waste treatment plant. In addition, educating people to use trays when changing oil in cars and not tipping waste products directly into road drains can dramatically reduce urban pollution.

## Love Your River

Love Your River is a Defra (Department for Environment Farming and Rural Affairs) campaign to get local people to understand and value water, and to take action to improve their local rivers and the environment around them. This has led to projects where volunteers, particularly anglers, have been involved in monitoring riverfly and other invertebrate levels to assess water quality and have also helped with litter picking and Himalayan Balsam removal.

## UPPER Maun, Mansfield

The UPPER Maun project has been a partnership between the Maun Conservation Group, the Environment Agency, Mansfield District council and many others.

The project has looked to engage with the local community in Mansfield, to help them re-connect with the Quarry Lane Nature Reserve and the River Maun which flows through the reserve.

The reserve is a wildlife oasis within an urban landscape, with the River Maun running straight through the middle of it.

The project has run for two years and has secured:

- Educational equipment to help engage schoolchildren;
- Equipment to support promotional activities;
- Reduced height interpretation boards (that can now be used by young wheelchair users amongst others);
- Improvements and restoration of a scrape (pictured), which included a new path, access platform and re-profiling of the scrape.



This has enabled the Maun Conservation Group to:

- Deliver a much wider and more inclusive education program with local schools, with over fifty educational visits delivered in the last year;
- Engage with other groups, including the local college, the Sea Cadets, and two local special needs groups;
- Start a new 'Wildlife Watch' group that has been so successful it has won a national award from The Wildlife Trusts;
- Engage with people on an ad hoc basis and encouraging to take pride in the river;
- Promote the group and the work they do at local fetes, festivals, fairs, at council offices, in shopping centres and even at the local museum;
- Grow membership of the group to include a greater diversity that reflects the local community;
- Raise the profile of the reserve and the positive impact people can have on their own environment by making small changes to what they do.



# Community Actions

A lot of the identified projects relate to lack of information available to the general public, something which through increased literature and public awareness-raising can be rapidly addressed. It has also been highlighted that local communities should be more involved in the water environment and action should be taken to encourage this.

## The Way Forward

- Develop an education package, or use the yellow fish campaign, to be delivered in schools and to community groups.
- Develop a range of literature on WFD, land drainage issues, phosphate use and other FAQ's which can be distributed to the public,
- Develop a user group of local people, riparian landowners, local authorities and other stakeholders to take ownership of the rivers  
The user group could split into sub-groups to look at funding opportunities, project selection and delivery etc.
- Encourage the local community to take ownership of rivers through friends groups and user groups, possibly using the EA Waterside Care format.
- Increased signage to educate dog owners on responsible behaviour around water.
- Encourage responsible use of motorised vehicles and boats on or around water.
- Work with angling groups to ensure responsible fishing takes place.
- Creation of a series of walks and trails through the catchment.

## How will this be achieved?

Various sources of funding will be investigated in order to deliver the following;

1. For development, training and possibly

delivery of education packages which could be delivered by volunteers or sessional workers.

2. For development of new literature.
3. To cover admin costs for the hosts of the user group
4. For officer time to provide support and set groups up.
5. For development of new signage aimed at both dog owners and other riparian users.
6. To develop riverside walks and trails.
7. To cover officer time to provide advice and support to angling groups.

### Yellow Fish

The Yellow Fish campaign is an Environment Agency (EA) project which aims to raise awareness of the fact that road drains link directly to brooks, streams and rivers, and the motto is "only rain down the drain!"<sup>(8)</sup> There are already two resource packs available; one for education and community groups and one for businesses and constructors, which are available free of charge. In addition they can provide stencils to paint yellow fish onto roadside kerbs above drains to indicate where the water is going to.

# Development and Industry

Development within the catchment can significantly increase both point source and diffuse pollution, as well as providing additional pressures through the requirement for access to open space.

Existing urban areas can increasingly be targeted to allow WFD gains through the use of education and encouraging the community to become interested in the water environment. A large amount of diffuse pollution comes from roads. Tyres leave behind rubber, oil and petrol spills gradually get washed into watercourses and all manner of other chemicals used for washing cars, keeping windscreens clean and de-icing cars, all contribute to pollution.

New developments should be encouraged to be built away from watercourses and to provide a significant buffer around the edge of the development. The use of Sustainable Drainage Systems (SuDS) should be encouraged at new developments as well as 'rain gardens' along new and existing roads.

Development also increases the risk of flooding, not only when close to water. Adequate drainage needs to be in place, as well as flood retention areas (using SuDS) and in-built property resilience should be considered. Where possible culverts should be avoided and if possible, when creating new developments, existing culverts and hard engineering of channels should be removed, and a more natural river restored.

Over abstraction of water contributes greatly to low flows in the catchment, affecting wildlife and water quality, as any chemicals present will be diluted by smaller amounts. Currently 25% of abstraction licences within the catchment are time limited; this means that they will be reviewed after a certain

period of time, whilst the remaining historical licences are open ended. Currently no further water is available (either surface or ground) for new abstraction licences. Where water flows fall below the legally acceptable level it is possible for the EA to either change or revoke existing abstraction licences. Recently the flow levels have fallen below acceptable levels in 15 waterbodies within the Idle and Torne catchment triggering investigations into flow levels and whether this is being caused singularly or cumulatively by licensed abstraction or by other factors.

Much of the sub-catchment consists of ex-mining communities, with many disused mines scattered across the area, which can lead to contaminated water entering the catchment. In addition subsidence has caused problems with low flows in some areas of the catchment, particularly at Vicar Water where more investigation into this is required. The restoration of disused colliery sites, such as Rufford Colliery, can lead to additional WFD benefits, with improved drainage and filtration, removal of contaminated materials and often creation of recreational spaces close to water.

## Sustainable Drainage Systems SuDS

SuDS are designed to reduce the potential impacts of new and existing developments on surface water discharges. They aim to replicate natural water processes and reduce flash floods which can be caused by decreased permeability of the land caused by development. These systems are intended to slow water down, hold it back in ponds and reedbeds and filter some of the contaminants out, before the water reaches the main watercourse.

# Development and Industry Actions

In order for WFD and all its implications to be fully considered within new building developments, it is necessary to begin considering this at the planning stage. It is vital that the planning departments of local authorities are engaged with to ensure that they understand their obligations under WFD. This will help them to advise applicants accurately and ensure that neighbourhood plans fully comply with WFD and build in resilience to flooding.

## The Way Forward

- Engage with local authorities, architects and major developers to ensure that WFD is considered at all stages of a planning application.
- Ensure that local plans take WFD into account.
- Encourage local authorities to retrofit SuDS and rain gardens alongside major developments and traffic routes.
- Liaison with mining companies to investigate pollution and subsidence issues relating to disused mines (including those restored/in restoration).
- Investigate low flows and whether these are linked to over-abstraction.
- Encourage the use of SuDS by new and existing businesses to allow pollutant removal prior to entering the watercourse.

## How will this be achieved?

1. Funding will be sought to develop and deliver a training course about WFD, biodiversity and SuDS which can be delivered to local authorities, architects and developers.
2. Funding will be sought to enable Nottinghamshire Wildlife Trust to circulate its 'Biodiversity and Urban Design'<sup>(9)</sup> guide more widely.
3. A continuation of the investigation into low flows across the catchment and their causes needs to be completed.
4. EA to liaise with mining companies to reduce impacts caused by historical industry.
5. Funding will be sourced to enable SuDS to be promoted to business and possibly to provide small grants to allow its implementation.

## Day Brook Rain Gardens

Ribblesdale Road in Sherwood, Nottingham, is adjacent to the Day Brook, a watercourse which is heavily modified and suffers from poor water quality partly caused by urban diffuse pollution. The brook has also caused flood events downstream of this location in the past.

A pilot SuDS retrofit was carried out by Nottingham City Council, the EA, Groundwork Greater Nottingham and Severn Trent Water with the aim of filtering surface water run-off, slowing the time it takes to enter the drain and reducing the amount of water entering the drain.

Within the grass verges twenty one rain gardens were constructed. The rain gardens use a combination of clean stone aggregate and proprietary units to create an area under the planted topsoil through which water can accumulate and gradually soak away. The plant species used (*Stipia arundinacea*, *Festuca* blue fox, and a species of *Carex* and one of *Miscanthus*) were chosen for their ability to tolerate fluctuations in soil moisture. In addition they also needed to be highly visible in order to alert pedestrians and motorists to the presence of the rain gardens, and to be evergreen to prevent a build up of leaf litter.

Post installation analysis has shown a reduction of 33% in the amount of water reaching the Day Brook in a 1:1 year storm. Further evaluation will be ongoing to assess the potential that this system presents.

This project also highlighted the need for community engagement, as many local residents did not like the aesthetics of the rain gardens and were unaware of the connection between the water running off their street and the Day Brook itself. In working with the community design adaptations could be made to make the system appeal more widely.<sup>(11)</sup>



Image: Environment Agency

# Water Management

The main sources of phosphates in the Idle sub-catchment are from rural diffuse pollution and from Waste Treatment Works (WTW), with additional inputs from household misconnections and other diffuse sources. In addition there are a significant number of septic tanks within the sub-catchment, with no real data available on whether these are allowing pollutants into the system. Of the many drinking water boreholes in the area, many suffer from nitrate, *Cryptosporidium* and pesticides issues, contaminating water for public consumption.

Silt entering the system also causes nutrient enrichment, algal blooms and problems for fish and invertebrates within the channel. This is often caused through agricultural mismanagement but can also be down to flood events or poor quality development within the flood plain leading to erosion.

There are problems with low flows in the catchment, particularly around Rainworth Water and Vicar Water, which may be a legacy from mining in the area. There are currently investigations taking place with various interested parties looking at the causes of this and possible solutions. In areas of low and intermittent flows, there can be a lot of problems for wildlife, especially fish and aquatic invertebrates which rely on constant flows for some or all of their life stages. If the flow disappears then this can lead to local extinctions of some types of wildlife.

## Landowner Engagement

Severn Trent Water has boreholes for drinking water abstraction on land which is within or close to livestock areas. Severn Trent Water wants to work in partnership with farmers in the River Idle area to improve groundwater quality to ensure that its customers continue to enjoy drinking water of the highest standards.

Recently 23 farmers attended a lively training event near Mansfield aimed at increasing awareness around *Cryptosporidium*, a parasite found in livestock manures. Farmers in vulnerable groundwater catchments were invited to attend the evening meetings to learn how they could help protect groundwater through improved manure and slurry management. The events were part funded by the DEFRA Landskills fund and run in partnership with the Trent Rivers Trust. Turnout and feedback from the events has been really positive, with most farmers commenting that they had learnt new skills which they could put into practice.

Following on from the workshop Severn Trent Water plan to offer support and advice to farmers to help them improve farm infrastructure and to enhance both the environment and water quality.



Image: Severn Trent Water



# Water Management Actions

The main issues identified relate to low flows, phosphate and silt deposition problems. In addition there are also problems caused by diffuse agricultural pollution and many of the borehole catchments are designated Safeguard Zones.

## The Way Forward

- Severn Trent Water are planning to offer advice and support to farmers to help reduce diffuse pollution from agriculture along with protecting and improving drinking water quality.
- Septic tank mapping, with targeted literature and owner visits with information on how to prevent leaks.
- Severn Trent Water to look at WTW and ensure facility upgrades take place where possible.
- Desilting to take place in specific locations, once silt inputs upstream are lessened.
- Investigate low flows in the catchment.

## How will this be achieved?

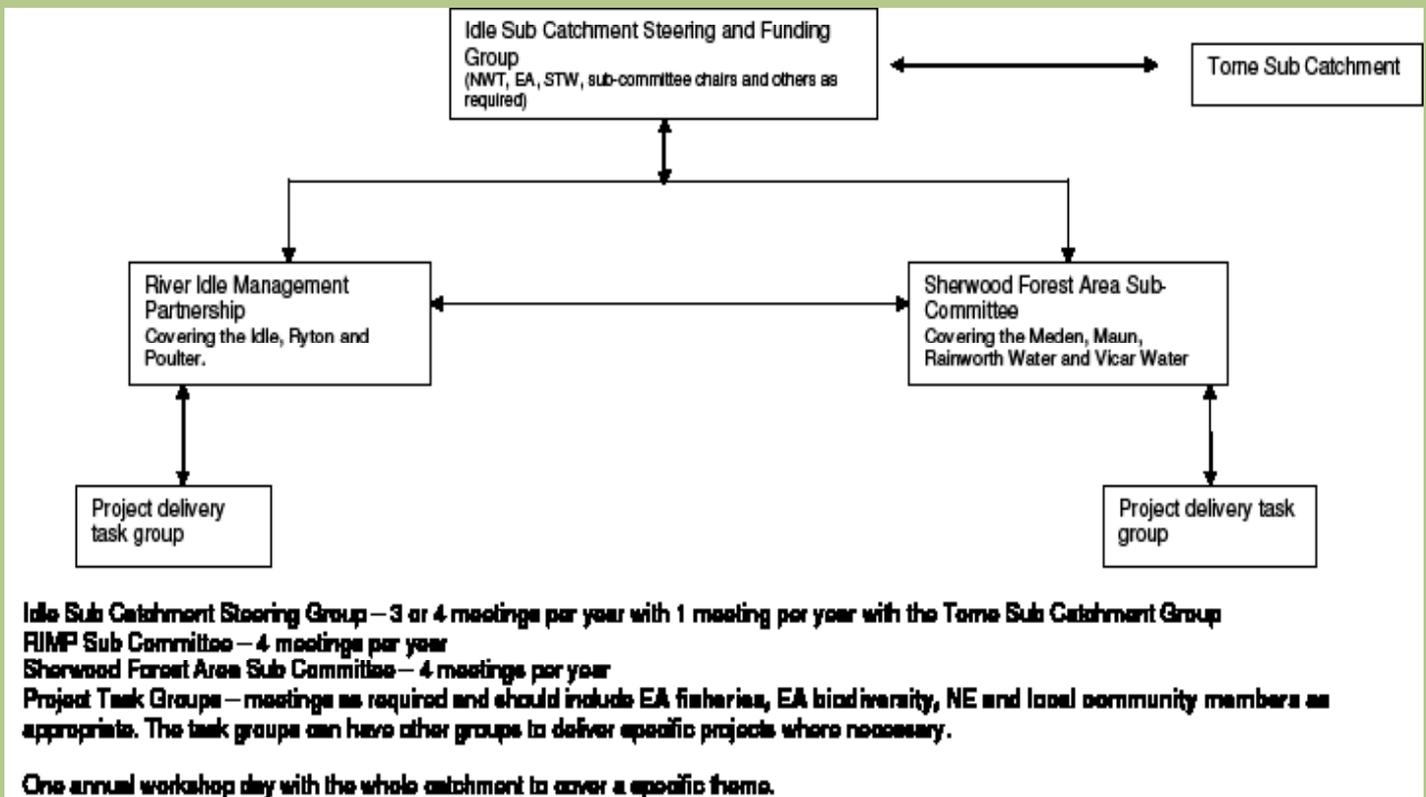
1. A continuation of the investigation into low flows across the catchment and their causes needs to be completed.
2. Severn Trent Water to continue with their phosphate management.
3. Funding to be sought to allow desilting to take place.
4. Funding to be sought to allow mapping of septic tanks and literature production to take place.

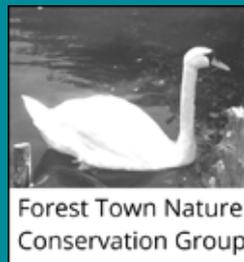
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## Proposed Governance Structure

The proposed structure for the River Idle Sub Catchment is as follows;





Cover images: Kingfisher: John Smith, Buttercup: Steve Hudson, Idle Valley view: Tarmac, Water Vole: Tom Marshall