



Rivers and Streams Habitat Action Plan

1. Introduction

This plan concerns all running water habitats (rivers and streams) within the county. It does not include canals, which have their own Action Plan within this BAP. Rivers were listed as a priority UK BAP habitat and subsequently within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

2. Current Status

2.1 Description of habitat

Rivers, streams and their associated riparian habitats provide an essential wildlife corridor linking fragmented habitats through often intensively farmed rural areas and built up urban areas alike and are a vital and integral part of the natural and semi-natural environment. They provide water for many wetland wildlife sites as well as providing a unique range of habitats for a diverse array of flora and fauna. These associated habitat features are often species rich (or have been in the past prior to agricultural intensification).

Most rivers in Worcestershire are typical of lowland rivers in that they meander through large floodplains. Our rivers have for the most part been significantly modified and their natural character has been reduced through the construction of weirs, flood defences, dredging, straightening and impounding, all resulting in a reduction in structural diversity and prevention of habitat regeneration. Many of our rivers and streams were straightened, deepened, re-sectioned and dredged to allow for agricultural intensification post-World War Two until the early 1990's. These modifications have caused a reduction in fish movement, loss or inaccessibility of physical habitat for fish spawning and juvenile development and a reduction in the value of aquatic flora, along with a disconnection of rivers from their floodplains, reducing the quality of riparian habitat. There are many smaller rivers, brooks and streams that flow through valleys and consequently have smaller, but still important, floodplains. These smaller watercourses tend to have retained a more natural character, although many have been modified to a certain extent.

The natural flooding of rivers and streams is an essential requirement for most of our floodplain wetlands and the best watercourses and riparian zones for biodiversity are those that have been least affected by human modification and exhibit the most natural features typical of the river type. Rivers and streams that exhibit the greatest diversity of flow patterns and channel features (riffles, pools, glides, side bars, coarse woody debris, islands, meanders, erosion, etc.) provide important habitat niches for wildlife.

Despite human influence the rivers and streams of Worcestershire support a wide range of native species including both salmonid and coarse fisheries, otter (*Lutra lutra*), water vole (*Arvicola amphibious*), white-clawed crayfish (*Austropotamobius pallipes*), common club-tail (*Gomphus vulgatissimus*) and depressed river mussel (*Pseudanodonta complanata*), as well as specialist plants and a number of bird species associated with the rivers and their banksides. Water quality in our rivers and streams has been steadily improving in recent years, mainly due to modern

regulations from EU Directives (e.g. Water Framework Directive) resulting in better regulation of discharges into rivers and streams.

2.2 Distribution and extent

Rivers and streams flow throughout the urban and rural areas of Worcestershire providing an arterial network for wildlife that extends into neighbouring counties. Most rivers and streams in Worcestershire ultimately flow into the River Severn, except for a few small streams in the north east that flow into the headwaters of the River Blythe in the Trent Catchment, and some small streams which flow into the Wye Catchment. The River Severn flows through the middle of Worcestershire with its major tributaries being the Avon, Teme and Stour.

2.3 Protection for the habitat

- Legal protection can be granted through the designation of a Site of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended).
- Rivers are listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
- Watercourses not meriting SSSI status can be listed as a Local Wildlife Site (LWS). Although not a statutory designation LWS status does confer some protection through the planning system.
- The Environment Agency, the Lower Severn Drainage Board, Local Authorities and Severn Trent Water have a statutory duty to further conservation where consistent with the purposes of enactments relating to their functions (as set out in the Water Resources Act 1991, Land Drainage Act 1991 and the Environment Act 1995). The Environment Agency has a statutory duty for pollution control, flood defence and water abstractions.
- All rivers and streams fall within the remit of the Water Framework Directive (WFD) which was transposed into UK law in 2003. The WFD establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which aims to prevent further deterioration, and to protect and enhance the status of aquatic ecosystems and the terrestrial ecosystems and wetlands directly dependent on them. The Environment Agency is aiming to achieve 'good status' in 60% of all waters by 2021 and in as many waters as possible by 2027.
- The NERC Act 2006 amended the flood defence byelaw-making powers of the Environment Agency, Local Authorities and Internal Drainage Boards to require them to take nature conservation into account when determining consent for flood defence works.
- The Flood and Water Management Act 2010 provides for better, more comprehensive management of flood risk. The Act also provides lead local flood authorities, North Worcestershire Water Management, South Worcestershire Water Management and the Environment Agency with a power to request information if required in connection with their flood risk management functions.
- The Wildlife and Countryside Act 1981 (as amended), The Conservation of Habitats and Species Regulations 2017 (as amended) and Countryside and

Rights of Way Act 2000 contain legislation that protects specific species of flora and fauna to varying degrees and also allows for the protection of natural habitats through Designations. This protection of species and habitats has a direct impact on rivers and streams throughout the county. The legislation also places an onus on Competent Authorities to assess their work and any consents and authorisations that may have an effect upon Special Areas of Conservation (SAC), Special Protection Areas (SPA) or SSSI's.

3. Current Factors affecting the Habitat

- **Pollution**

Agriculture, housing development, industry and highway runoff has caused long-term pollution to rivers and streams. In addition sewage treatment companies have historically discharged poorly treated effluent into watercourses. Modern regulations and enforcement methods have greatly reduced effluent discharges and agricultural activities are also starting to be tackled in a more effective manner. However, there is still a chronic issue with phosphate pollution in many of the county's watercourses.

- **Flood Defence and Land Drainage Works**

Historic and ongoing flood defence and land drainage work has destroyed the natural form of the majority of rivers and streams in Worcestershire. Dredging, straightening, widening and canalising of many of our rivers has resulted in a dramatic loss of associated flora and fauna. Many important features such as riffles and pools have been lost and the rivers and floodplains no longer act as self-functioning ecosystems.

- **Development Within the Floodplain**

There has been widespread and inappropriate development in most river floodplains. This has led to the loss of many wetland habitats, including the loss of open water features. One of the most worrying aspects of this development is that it will be very difficult, if not impossible, to restore natural river function in many places because of the potential for increasing the flood risk to inappropriately located buildings.

- **Agricultural Land Use**

Changes in farming practices since the Second World War have resulted in the large-scale intensification of our agricultural industry. Modern techniques have allowed previously unproductive land to be turned over to arable production and once uneconomic crops are now economical. This intensification has resulted in increased chemical inputs and the large scale draining of land. This has led to increased rates of chemical runoff, soil erosion leading in some part of the county to significant and damaging amounts of silt entering watercourses and increased surface water runoff, leading in some cases to direct flooding. The use of metaldehyde slug pellets on land adjacent to watercourses is also a serious cause of environmental harm where residues are washed into the water.

- **Water Abstraction**

Ground and surface water abstractions are regulated through abstraction licences, however, the unsustainable licensed (and unlicensed) abstraction of water for agriculture, industry and domestic use over many decades has had serious impacts on flow rates and on the quality of habitats associated with the riparian corridor, such as fen, marsh and wet woodland. In some severe cases over abstraction has resulted in low flow levels in some streams, even

resulting in seasonally dry channels. The increasing frequency of summer droughts is also placing a higher demand on our limited water supply.

- **Invasive plants and animals**

Invasive species threaten wetland environments as they out-compete and ultimately eradicate native flora and fauna from their particular niches. Species such as the American signal crayfish (*Pacifastacus leniusculus*), mink (*Mustela vison*), zander (*Sander lucioperca*), zebra mussel (*Dreissena polymorpha*), Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*) all risk causing considerable harm and are particularly difficult to control. The presence of dense stands of Himalayan balsam along a watercourse will also significantly increase the risk of soil erosion from the banks.

- **Inappropriate River Management**

Culverting watercourses, retaining them in engineered walls (such as concrete, sheet piling or gabion baskets), dredging, over grazing, cattle poaching, inappropriate planting and a lack of management along riverbanks has led to a reduction in habitat diversity along rivers and streams.

- **Recreational Activities**

Many recreational activities such as angling, off-roading, walking and boating can have a significant destructive impact if not properly regulated.

- **Modification for Boat traffic**

Lengths of the Rivers Severn and Avon through Worcestershire have been modified for navigation. Artificial weirs and the widening, dredging and straightening of the river have resulted in a considerable loss of habitat diversity. A significant length of the River Severn was reinforced using rock armour to allow commercial shipping up as far as Worcester. This resulted in the near total loss of aquatic vegetation and the consequential reduction in aquatic fauna. Commercial shipping ceased along this part of the River Severn soon after the river engineering works was completed. The rivers are now used almost entirely by pleasure boats. The transport of sand and gravel along the River Severn by barge from Saxon's Lode provides a more sustainable method of transportation.

- **Lack of Awareness/Information**

For example, the enormous biodiversity value of features such as large woody debris has only recently been appreciated. Previously such features were removed to allow water to flow more freely but are now being deliberately installed in appropriate locations.

4. Current Action

4.1 Local Protection

- The River Teme has been designated a SSSI for its associated flora and fauna. A small part of the Old River Severn SSSI is in Worcestershire at Upper Lode. The latter is designated because of its botanical, dragonfly and bird interest. The Dowles Brook is part of the Wyre Forest SSSI/National Nature Reserve (NNR) and is therefore protected under the SSSI legislation. Similarly, the Ipsley Brook flows through Ipsley Alders SSSI and is therefore protected for that section. Parts of various other rivers and streams which flow through SSSI's are also protected.

- The majority of watercourses in Worcestershire have been listed as LWS. Many have been listed due to specific species assemblages or habitats (such as riffle and pool streams), whilst some may have been listed for their general importance as habitats and corridors for a wide range of biodiversity.
- There are numerous nature reserves within the county that are adjacent to or have rivers or streams associated with them. Appropriate management on these sites can and does add value to the river or stream.

4.2 Habitat Management and Programmes of Action

- In 2000 the Severn and Avon Vales Wetlands Partnership (later Wetlands West) was formed to restore floodplain habitats on a catchment wide scale. In its 16 years of operation the partnership worked within an area of 7,500 ha within the floodplains of the two rivers in Worcestershire and Gloucestershire, delivering a significant amount of habitat creation and restoration. Much of this work was funded through agri-environment scheme payments.
- Worcestershire Wildlife Trust, in partnership with the Environment Agency, began work within the Bow Brook catchment in 2011 to restore habitat, water quality and river morphology features.
- In 2012 Worcestershire Wildlife Trust and the Environment Agency worked with landowners on a tributary of the Dowles Brook in the Wyre Forest to see if an intensive 3-year effort could successfully remove Himalayan balsam by hand pulling the plant.
- In 2015 Worcestershire Wildlife Trust launched the Love Your River Bromsgrove project, working with local schools and communities to carry out habitat improvement works, provide training to spot and monitor levels of pollution and check for and solve household drain misconnections. It is hoped to roll out the Love Your River approach to other areas of the county within the lifetime of this Action Plan.
- Funding of £22 million was secured in 2016 for the Unlocking the Severn Project, a partnership between the Canal & River Trust, Environment Agency, Severn Rivers Trust and Natural England. The project will re-open the Severn to fish migration and reconnect local communities with the lost natural, cultural and industrial heritage of the river. The project will particularly benefit the Twaite and Allis shad by substantially increasing access to 253 kilometres of historic spawning grounds, as well as other critically declining species such as salmon (*Salmo salar*) and the European eel (*Anguilla anguilla*).
- In 2017 Severn Trent Water and the Environment Agency began work on the restoration of the Battlefield Brook where it flows through Sanders Park in Bromsgrove. The work will remove the concrete channelling that currently contains the brook and re-landscape the bed and banks to a more natural profile.
- Water Level Management Plans have been produced for several wetland areas in Worcestershire. They are a key document to inform site management and four of the highest priority sites are situated around Kidderminster. Of these, work has taken place or is ongoing at Wilden, Puxton and Stourvale Marshes to raise water levels and restore condition of these SSSI's.

4.2 Survey Research and Monitoring

- The majority of watercourses in Worcestershire are routinely monitored for their Ecological and Chemical Quality through the General Quality Assessment Scheme (GQA). There is a network of rain gauges, river flow gauges and observation boreholes that monitor the water resources in the county.
- A core element of the Love Your River project approach is engagement with the public and promoting involvement in citizen science initiatives. The Love Your River Bromsgrove project, led by Worcestershire Wildlife Trust, has trained and supported volunteers to undertake water chemical monitoring and invertebrate and water vole surveys.
- The Severn Rivers Trust has been promoting riverfly surveys as part of the national Riverfly Partnership initiative, training and supporting volunteers to carry out survey work.
- In 2016 the Severn Rivers Trust and the Environment Agency collaborated on an experimental project in the Suckley Brook catchment to trial the extermination of signal crayfish through sterilization. The results fed into a PhD research project and led to the formation of a volunteer group, the Suckley Hills Improvement Group, who are continuing to monitor local crayfish populations and control non-natives.

5. Associated Plans

Reedbeds, Wet Woodland, Fen and Marsh, Wet Grassland, Canals, Otter, Water Vole, White-Clawed Crayfish, Shad, Common Club-tail, Black Poplar.

6. Conservation Aim

All rivers and streams in Worcestershire to be of improved water quality and show geo-morphological features and species assemblages that would be expected of natural rivers and streams in the County.

7. Conservation Objectives

- Partners engaged in river and stream restoration to take a catchment approach and use catchment-based partnership processes e.g. CABA
- Develop a list of priority actions for each Worcestershire sub-catchment, with associated projects coming forward in line with funding and opportunity
- Successful completion of Unlocking the Severn Project
- Restoration of historic oxbow features on the Carrant, Squitter and Washbourne Brooks as part of the Carrant Catchment Area Restoration Project
- Participate in national trials of biological control agents for invasive species such as Himalayan balsam; seek to eliminate invasive species where practicable
- Partners seek to accrue funding for survey and monitoring programmes
- Increase the use of citizen science recording and monitoring for example through projects such as the Love Your River initiative

References and further information

Addy, S., Cooksley, S., Dodd, N., Waylen, K., Stockan, J., Byg, A and Holstead, K (2016). *River Restoration and Biodiversity: Nature-based solutions for restoring rivers in the UK and Republic of Ireland*. The International Union for the Conservation of Nature (IUCN) National Committee UK and Scotland's Centre of Expertise for Waters (CREW). <http://www.ecrr.org/Publications/RiverRestorationandbiodiversity.pdf>

Boon, P. J and Raven, P. J (2012). *River Conservation and Management*. Wiley-Blackwell.

Dudgeon, D., Arthington, A., Gessner, M., Kawabata, Z., Knowler, D., L  v  que, C and Sullivan, C (2006). *Freshwater biodiversity: Importance, threats, status and conservation challenges*. *Biological Reviews*, **81**, pp163-182.

Environment Agency guidance on managing woody debris

<http://evidence.environment-agency.gov.uk/FCERM/en/SC060065/MeasuresList/M5/M5T3.aspx?pagenum=2>

Elbourne, N., Hammond, D and Mant, J (2013). *Weir removal, lowering and modification: A review of best practice*. Environment Agency. <https://www.gov.uk/government/publications/weir-removal-lowering-and-modification-a-review-of-best-practice>

European Centre for River Restoration

<http://www.ecrr.org/RiverRestoration/Habitatsandbiodiversity/tabid/2616/Default.aspx>

Farm Wildlife website <https://farmwildlife.info/how-to-do-it/wet-features/streams-and-rivers/>

Mainstone, C. P (2010). *An evidence base for setting flow targets to protect river habitat*. Natural England Research Reports, Number 035. Natural England, Sheffield.

Mott, N (2006). *Managing Woody Debris in Rivers, Streams & Floodplains*. Staffordshire Wildlife Trust, Stafford, UK.

https://www.therrc.co.uk/MOT/References/WT_Managing_woody_debris.pdf

Natural England (2015). *River restoration theme plan. A strategic approach to restoring the physical habitat of rivers in England's Natura 2000 sites*. Natural England.

Natural England & RSPB (2015). *Climate Change Adaptation Manual - Evidence to support nature conservation in a changing climate (NE546) – 10 rivers and streams* <http://publications.naturalengland.org.uk/publication/>

Holmes, N and Raven, P (2014). *Rivers*. British Wildlife Collection **Vol 3**, pp432.

Owen, G. J., Benskin, C. McW. H., Perks, M. T., Wilkinson, M. E., Jonczyk, J and Quin, P. F (2012). *Monitoring agricultural diffuse pollution through a dense monitoring network in the River Eden Demonstration Test Catchment, Cumbria, UK*. *Area* **44**, pp443-453.

Pattison, Z., Vallejo-Mar  n, M and Willby, N (2018). *Riverbanks as Battlegrounds: Why Does the Abundance of Native and Invasive Plants Vary?* *Ecosystems*, p 1-9.

<https://link.springer.com/article/10.1007%2Fs10021-018-0288-3>

Severn Rivers Trust Unlocking the Severn Project website and links:
http://severnriverstrust.com/projects_categories/unlocking-the-severn/

The River Restoration Centre <https://www.therrc.co.uk>