BLACK COUNTRY WYRLEY & ESSINGTON CANAL LOCAL

NATURE RESERVE DRAFT

MANAGEMENT PLAN

March 2017

In association with

CITY OF WOLVERHAMPTON COUNCIL

Walsall Council

CONTENTS

1. Introduction

The Wyrley & Essington Canal (W&E Canal) is an artificial waterway that constitutes a natural asset in a highly urban environment. Designating the canal as a Local Nature Reserve (LNR) offers the potential to improve connectivity between local communities and their natural environment. Achieving Local Nature Reserve (LNR) status will provide the opportunity for the W&E Canal to undergo enhancements aimed at increasing public interaction, maintaining ecological stability and promoting a healthier lifestyle.

In 2013 the Canal & River Trust (C&RT) was approached by Wolverhampton Councillor, Phil Bateman MBE, to assess at the benefits of gaining LNR status for the canal in the Wolverhampton area. Discussions took place between the City of Wolverhampton Council and Walsall Metropolitan Borough Council in 2014. Both authorities concluded that seeking LNR status was the most appropriate solution to achieving both greater recognition for this valuable canal and facilitating its future management. The LNR management plan is the outcome of a joint partnership between C&RT, City of Wolverhampton Council and Walsall Metropolitan Borough Council and will be delivered through the Black Country Wyrley & Essington Local Nature Reserve Steering Group.

The high ecological value of the canal was formally recognised in light of a detailed study undertaken by British Waterways' consultants, Halcrow in 2007. Further studies were commissioned by Wolverhampton City Council in 2013. As a result of these studies the Wolverhampton section of the canal was designated the regionally recognised 'Site of Importance for Nature Conservation' status. In Walsall, sections of the canal and adjoining sites already enjoy ecological designations including 'Site of Local Importance to Nature Conservation'. Implementing the LNR will facilitate the connection of fragmented habitat, offer a wildlife corridor to a number of species and safeguard populations through the provision of enhanced natural resources.

1.1 Vision Statement

The vision for the Wyrley & Essington Canal is to improve the awareness and use of the canal as a site for both recreation and education within the local community whilst protecting, and wherever possible enhancing, its natural beauty and rich biodiversity.

1.2 Aims & Objectives

The overall vision for the Wyrley and Essington canal is supported by a number of objectives. Realisation of these objectives will be achieved through an action plan (Appendix 3) the delivery of which will be managed by the steering group.

1.2.1 Overall Aim

1.2.1.1 To ensure that the Wyrley & Essington Canal is maintained as a Local Nature Reserve, benefitting both biodiversity and the community in a manner that compliments the management goals of other conservation sites within the landscape.

1.2.2 Objective 1: Nature Conservation

1.2.2.1 To improve and conserve the ecology of the canal channel and the surrounding landscape.

1.2.2.2 Provide effective management of the Local Nature Reserve, across local authority and land-owner boundaries, enabling improved interaction between the local community and their environment whist protecting and improving ecology.

1.2.2.3 To conserve, extend and enhance the quality of heath habitat along the canal.

1.2.2.4 To conserve and where possible enhance the landscape and heritage features of the canal where such activity does not conflict with important biological interest.

1.2.3 Objective 2: Ensuring Easy Access for the Community

1.2.3.1 To provide suitable facilities and opportunities for public enjoyment of the canal, including both the local community and visitors to the site, providing these do not conflict with ecological concerns.

1.2.3.2 To generate a sense of community ownership of the site and encourage active involvement in the care and management of the canal.

1.2.3.3 To enhance and where possible extend access for local people and visitors to the canal.

1.2.3.4 To ensure that antisocial behaviour is controlled and its effects reduced.

1.2.4 Objective 3: Improving and Enhancing Opportunities for Walking, Cycling & Boating

1.2.4.1 To inform and educate the local community about their canal, with a particular focus on ecology, health and public interaction.

1.2.4.2 To ensure that the canal is managed to balance the needs of its many different users in a manner that also safeguards its ecology and heritage.

1.2.4.3 To increase the number of visitors across all the different user groups

2 Site Description

2.1 Location

The Wyrley & Essington (W&E) Canal is located in the north of the Black Country, and connects City of Wolverhampton to Brownhills, passing to the north of Walsall town centre. It is approximately 27km in length from its most westerly point in Wolverhampton City centre to its most easterly point at which it connects with the Anglesey Branch canal near Brownhills (Figure 2.1). The Anglesey Branch of the canal continues for a further 4km to Chasewater Reservoir in Staffordshire which is the main feed and source of the canal's water.

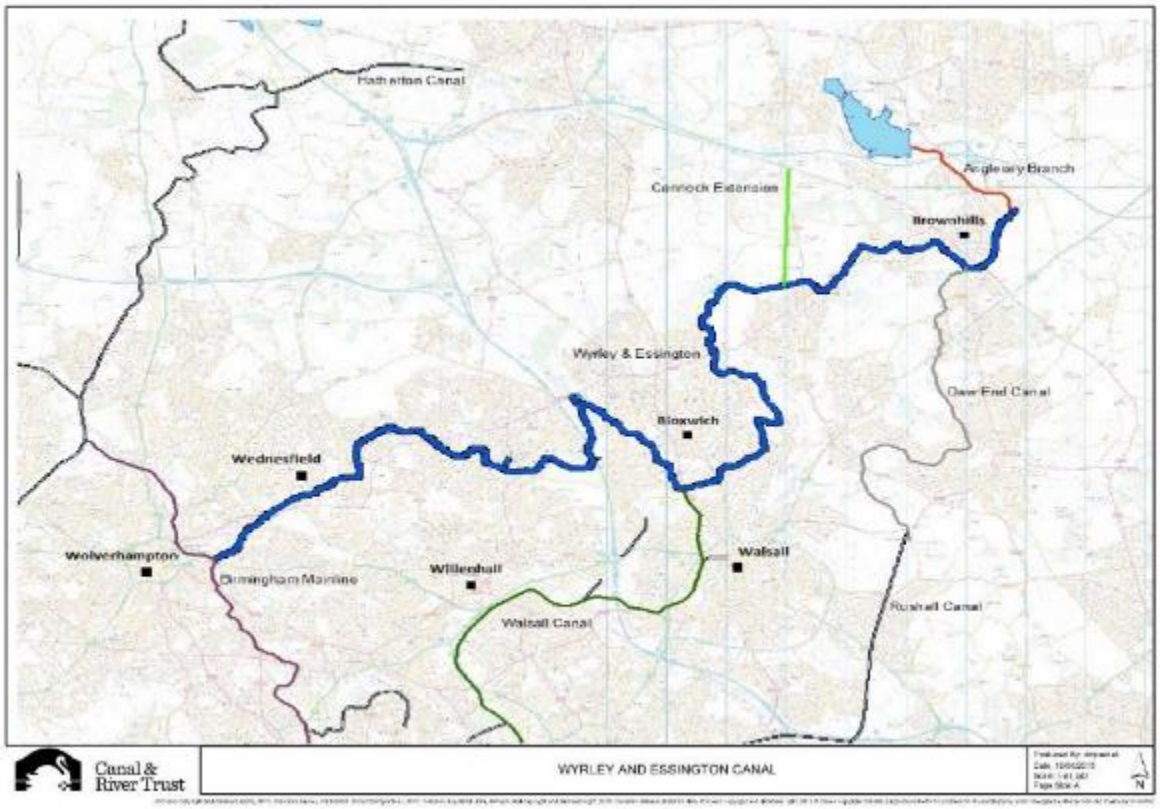

Figure 2.1: Location of the Wyrley and Essington Canal

The canal crosses both Walsall and Wolverhampton local authority areas. The proposed LNR designation and this management plan cover 27 km of the W&E Canal however scope exists for future expansion to cover the Anglesey Branch up to the c. 560 metres designated as part of the Chasewater Site of Special Scientific Interest (SSSI). A series of more detailed maps showing the course of the W&E Canal are provided in appendix 1.

The width of the proposed LNR varies along its length and the different land uses have allowed diverse habitats to establish. The land is a mixture of:

- Woodland
- Grassland
- Industrial
- Rural agricultural
- Residential Peri-urban
- Heathland
- Commercial

As part of the LNR proposal the currently fragmented non-statutory wildlife sites identified in figure 2.2 will be connected and protected enhancing their ecological value.

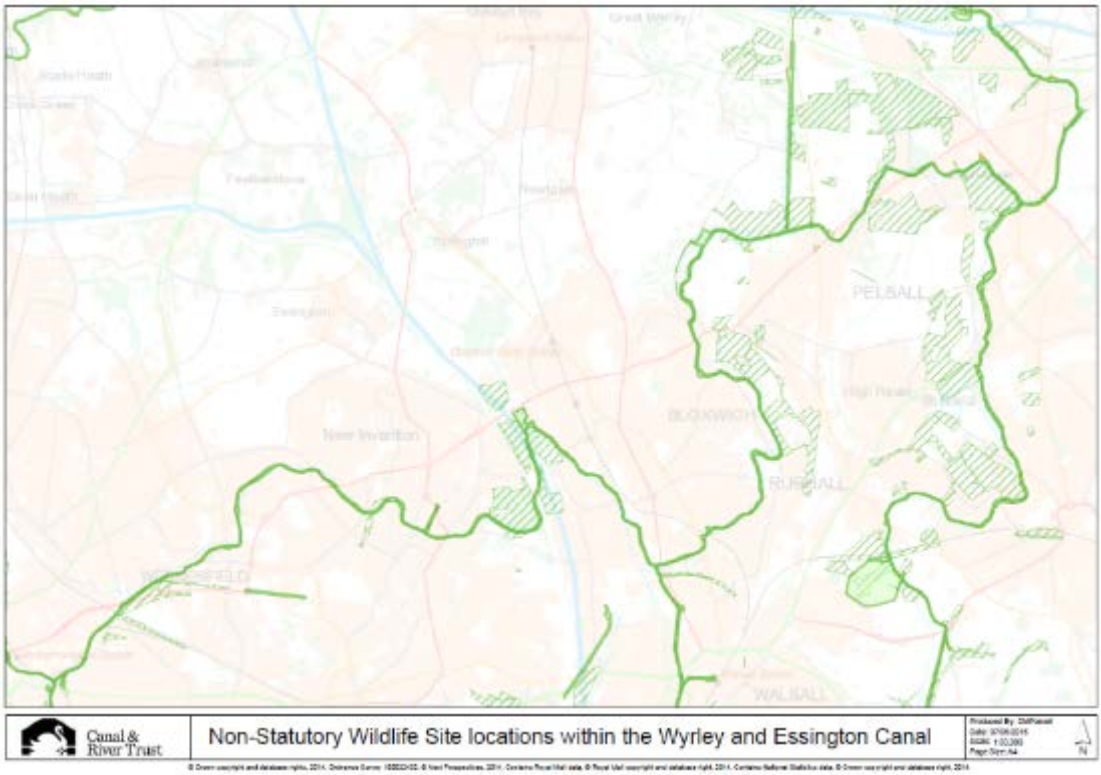

Figure 2.2: Non-statutory wildlife sites along the Wyrley and Essington Canal are shown as green striped areas. The green line along the canal represents the area which is owned by the Canal and River Trust.

One of the key assets of the canal lies in its ability to connect isolated strips of fragmented habitat into wider habitat corridors. The potential ecological benefits that this unique property conveys adds further weight to the case for LNR designation. The construction of the water course divided and generated a diverse range of habitats in the 1790s and is now a vital link

for species populations. As the W&E Canal meanders through the landscape, it passes several areas of ecological interest such as Pelsall North Common SLINC; Rough Wood SLINC; Clayhanger SSSI lies to the south of the canal, which does pass Clayhanger Common; and the Cannock Extension Canal Special Area of Conservation and SSSI. While these areas are significant for different reasons all contain valuable habitats which have been increasingly threatened by development and industry during the last 200 years.

As a result, management of the LNR will not only seek to conserve these precious habitats but will aim to enhance and extend the range of such habitats and the associated species. It is envisaged that improving the connectivity of previously fragmented habitats will benefit both the stress tolerance and ecology of the associated species.

2.1.1 Wyrley and Essington Canal Local Nature Reserve (Wyrley Branch)

The Wyrley Branch of the Wyrley and Essington Canal was declared a Local Nature Reserve by South Staffordshire Council in 2008. It extends for almost four kilometres through South Staffordshire from the boundary with Walsall near Broad Lane, Essington, through Great Wyrley to Dundalk Lane, Cheslyn Hay.

The branch canal was once busy with boats carrying coal from the pits around Great Wyrley and Essington. With the decline of the pits, the canal closed in the mid 1950s and fell into disrepair.

In 1980, South Staffordshire Council commissioned a feasibility study to restore the canal. The restored towpath and new footpaths through open areas were raised above water level to ensure that the walk remains usable throughout the year. Timber footbridges have been installed to create interest and provide long views along the canal. Wherever possible, steps and changes of level have been eliminated.

Parts of the canal have been dredged to create areas of open water for wildlife. Information panels have been installed to show a plan of the walk, explain the history of the canal and illustrate its wildlife.

The landscape changes along the length of the canal and it contains a variety of wildlife habitats, including open water, dry canal bed, wet grassland, scrub and woodland. Throughout the canal walk, a selection of plants and animals, including invertebrates and bird life, can be found, some of which are locally and nationally scarce.

Access to the Reserve can be found at each end of the site at Broad Lane and Dundalk Lane, with a car park at each entrance.

The Wyrley Branch Friends Group works alongside the Council in the management of the LNR.

Further information is available at:

www3.sstaffs.gov.uk/your_services/environmental_services/grounds_maintenance/friends_groups/wyrley_branch_friends_group.aspx

2.2 Boundary

The proposed core area of the LNR consists of the canal corridor, which is owned and managed by C&RT, and adjoining local authority land which is suitable for inclusion. Figure 2.3 shows the proposed core area (65 ha) and also areas neighbouring the canal that are designated as non-statutory wildlife sites and could benefit from being incorporated into the LNR (51 ha). Figure 2.2 above details all of the adjoining non-statutory wildlife sites bordering the canal. There are currently two existing LNRs adjoining the canal, the Bentley Haye LNR covering 65 ha and Rough Wood Chase LNR.

The extreme southern end of the Wyrley Branch of the Wyrley and Essington Canal extends into Walsall Borough for about 150m from Broad Lane to the Walsall to Cannock railway line. Although this land was designated as the Wyrley and Essington Canal Local Nature Reserve by South Staffordshire Council in 2008, no record of this designation having been consulted on and processed as a cross-boundary designation could be found. Therefore, to regularise the section of the Local Nature Reserve designated in Walsall Borough, with the permission of South Staffordshire Council as the land owner, it is proposed that this section also forms part of the latest Wyrley and Essington Canal Local Nature Reserve proposals.

Comments are sought on the proposed boundary as part of the public consultation on this draft Management Plan. A series of detailed maps highlighting the proposed boundary are provided in appendix 2.

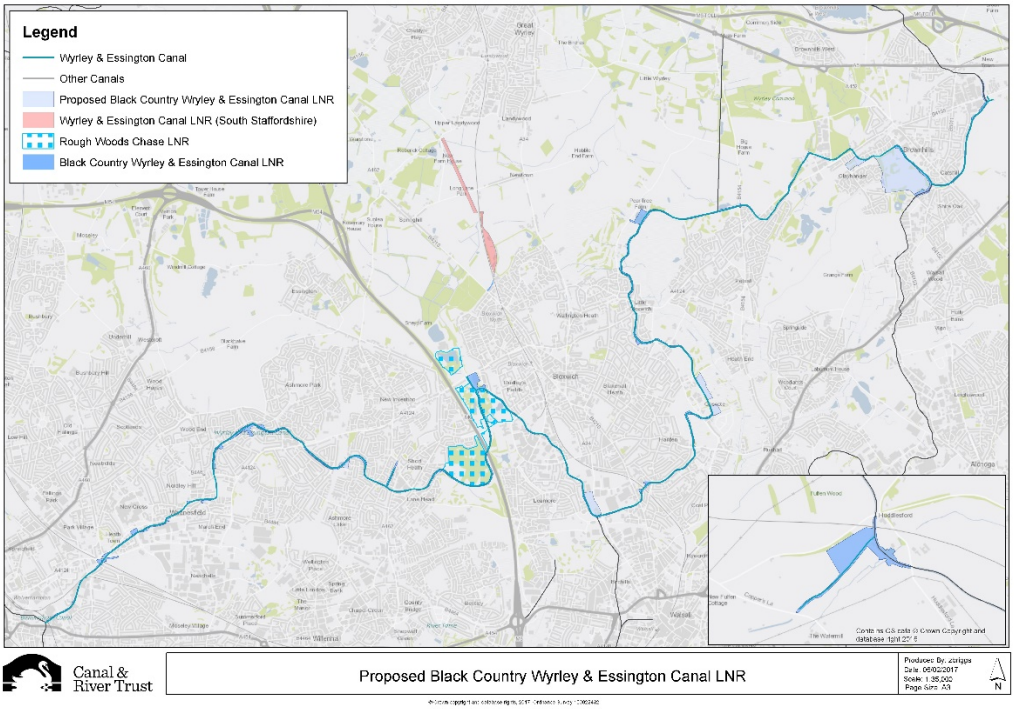

Figure 2.3: Proposed Black Country Wyrley & Essington Canal LNR boundary

2.3 Site History

The canal was originally built in 1791 to offer connectivity between Wolverhampton and the coal mines at Wyrley Bank and Essington. Coal was moved along the canal during this period with waste water from the mines deposited directly into the canal system. The rapidly developing mining industry resulted in increasing urbanisation and ironworks located near the canals encouraged populations to move to the area. This led to urban sprawl in areas such as Wolverhampton. Coal transportation via the canal network reduced significantly and was eventually abandoned as transportation by rail and later road became increasingly popular. Population growth and urbanisation continued as the West Midlands become increasingly industrialised. Today the area around much of the W&E Canal is heavily urbanised with more rural areas surviving to the North-East of the Canal.

Water quality will be heavily influenced by the transportation and deposition of pollutants as a result of surface runoff into the water way. Furthermore, chemicals from historic waste water may still reside in the canal bed sediments and will have an impact on the current ecology. In 1994, funding was made available to the Lichfield & Hatherton Canal Trust who began restoring sections of the W&E Canal. The creation of a LNR here will ensure that restoration efforts can be maintained and any prolonged damage to the water course will be identified and managed quickly through routine monitoring of the canal corridor.

2.4 Heritage

The Canal & River Trust is responsible for maintaining and preserving the associated heritage of the canal network. This includes both the canal itself and the associated infrastructure such as bridges, specialised structures including locks and historic buildings many of which are of local or national interest. Today the canal network has moved away from its original industrial purpose to a more recreational and domestic focus. However, the conservation of the canals characteristic infrastructure remains a high priority for the trust. The buildings and structures associated with the canal network can provide important habitats for many rare and unusual species, in particular those plants associated with lime mortar and the species of birds and bats that can find shelter in buildings for roosting or nesting. The bridges and structures can also provide opportunities for invertebrates and could, in the future, be important places where otters mark their territories.

The W&E Canal had many side arms and branches which hint at the legacy of its industrial past. A past mirrored in the collection of bridges which are a dominant feature of the W&E Canal. Several of the bridges have blue brick abutments and iron decks and parapets with traceried rails.

2.5 Tourism

Historical canal towpaths were of narrow design with sufficient width for a horse to pull the canal boat but no more. Despite this, the linearity of the towpath encourages local people to utilise the canal for walks, cycling and running. Access points on to the canal have increased due to demand with some unofficial access points used as desire lines. These frequent access points benefit local people and those wishing to use the canal. In most cases access

points to the canal towpath will be the first feature of the LNR that visitors encounter. Much can be done to make these access points more inviting. These measures could include improved lighting and ensuring boundary vegetation is managed more effectively to widen and open out access routes. Unofficial access routes with a high footfall can be developed as part of the infrastructure of the LNR.

Some areas of the W&E Canal are identified as potential routes for the National Cycling Network, while diverse fish stocks within the canal attracts both visiting and resident anglers.

Currently the W&E Canal is under-used by the boating community. Feedback provided to the Canal & River Trust by boaters, suggests that this is in part the result of concerns regarding safety and anti-social behaviour and in part due to a lack of tourist destinations and a general lack of mooring facilities. Considerable efforts have been made by City of Wolverhampton, spearheaded by Cllr Bateman, to welcome boaters from across the inland waterway to visit and stay within the Wednesfield/Bentley Bridge area of the W&E Canal.

The W&E Canal LNR has a potential role to play in driving forward local economic development in this area. A survey carried out in 2015, showed that between January and September an estimated 80 boat movements took place on the W&E Canal. A total of 64 visitors overnighted at Bentley Bridge during this period. Even at this modest level such tourism generated approximately £5,700 for the local economy. Furthermore 'pop-up' markets held in August and October 2015 attracted more than 1,100 visitors and resulted in trade from the visiting boater community. The hope is that by attracting a greater number of visitors to the LNR, the perception and economic value of the W&E Canal will change within the community. Not only will this benefit the local economy but should also discourage anti-social behaviour and provide a safer, more comfortable environment for boaters.

Much of the success of the management of the Wyrley and Essington Canal as an LNR will be measured in terms of the number of visitors it is able to attract. In order to set a realistic performance indicator against this objective is necessary to obtain a benchmark of current visitor numbers. It is proposed that this will be achieved through the use of electronic counters that can provide an indication of the footfall along parts of the canal. This information can then be used to calculate a figure for the target increase in footfall as a result of LNR management.

Designating a LNR with diverse ecology and habitats will encourage visitors and offers potential opportunities for education and research. It should be pointed out that the priorities for both ecology and tourism need to be balanced to ensure that both benefit.

2.6 Stakeholders

For the Black Country Wyrley & Essington Canal LNR, the key stakeholders are:

- *Canal and River Trust*
- *City of Wolverhampton Council*
- *Walsall Metropolitan Borough Council*
- Those who manage neighbouring protected sites and nature reserves.
- Birmingham & Black Country Wildlife Trust

- Local schools, colleges and the University of Wolverhampton
- Natural England
- Environment Agency
- Historic England
- All user groups who interact with any aspect of the canal such as boaters, anglers, cyclists and walkers.
- Local people

The Black Country Wyrley & Essington Canal LNR Steering Group covers the stakeholders highlighted in italics, who are also the land-owners. Other stakeholders will be consulted on this draft Management Plan and may be involved in delivering the actions set out in the Action Plan.

2.7 Physical Structure

2.7.1 Canal Source

The water in the canal comes from the Anglesey Branch canal (a historic feeder, widened for navigation), which is fed by Chasewater Reservoir. The water itself is of varying quality, clarity and turbidity depending on its location. In the more industrial areas there are more opportunities for surface run off, fly tipping and littering as well as point source and diffuse pollution. In the more developed areas there is also a distinct lack of bankside vegetation at the water's edge.

Improving the water quality throughout the LNR will be one of the underlying objectives of the management plan. Careful consideration needs to be given to the many species which make use of both the terrestrial and aquatic habitat. Any management of one habitat may have a direct impact upon the other, the consequences of which should be fully understood.

2.7.2 Canal Route

The W&E Canal is unusual in that it does not have locks along its length but instead meanders on one contour level. The canal offers opportunities for health and recreation to those who use the towpath and boaters alike.

2.8 Geology

The W&E Canal bedrock is known as the Pennine Middle Coal Measures Formation and was formed over 300 million years ago during the Carboniferous period. This sedimentary bedrock primarily contains mudstone, siltstone and sandstone deposited in aquatic environments. The puddle clay lining of the canal isolates the channel from the underlying geology affording the fine-grained bedrock some protection from erosion. Coal layers exist throughout the region and became the main industry, increasing the demand for a canal to be built. Superficial layers were generated by glaciofluvial processes which deposited a variety of till and moraines across the region that are eroded at different rates.

2.8.1 Soils

The material in the canal bed could potentially be rich in heavy metals from the local coal mines. Moving these substrates may impact local flora and fauna in a positive way. Previous research into contaminated canal sediments in the West Midlands identified high concentrations of phosphorus and heavy metals from the historic industrial land use. Therefore, planned dredging projects resulting in the disturbance of bed sediments should be subject to a full environmental appraisal.

3 Current Ecology

The information presented below is generated from data gathered by the C&RT as well as data collected during ecological surveys by City of Wolverhampton Council in 2013 and Walsall Metropolitan Borough Council in 2014.

Many of the species covered in the section below are part of the UK's Biodiversity Action Plan (BAP). Those listed in the BAP were recognised as being highly threatened and in need of conservation action. Species that are relevant to the W&E Canal have been listed in appendix 1. In the text, these species will be identified with an asterisk ('*') after their name. The presence of BAP priority species further demonstrates the ecological value of the W&E Canal. Management of BAP species will guide the priorities of the management plan with a particular focus on those regionally and nationally rare and keystone or umbrella species.

3.1 Biological Features

By working to improve water quality, habitat and through raising public awareness, the LNR has the potential to facilitate the spread of native species throughout the canal network. Encouraging the local community to engage in projects aimed at assisting our native species will not only educate but will bring positive media attention to the region. Working with communities to develop volunteering activities is a key priority for the plan.

3.1.1 Flora

3.1.1.1 Aquatic Plants

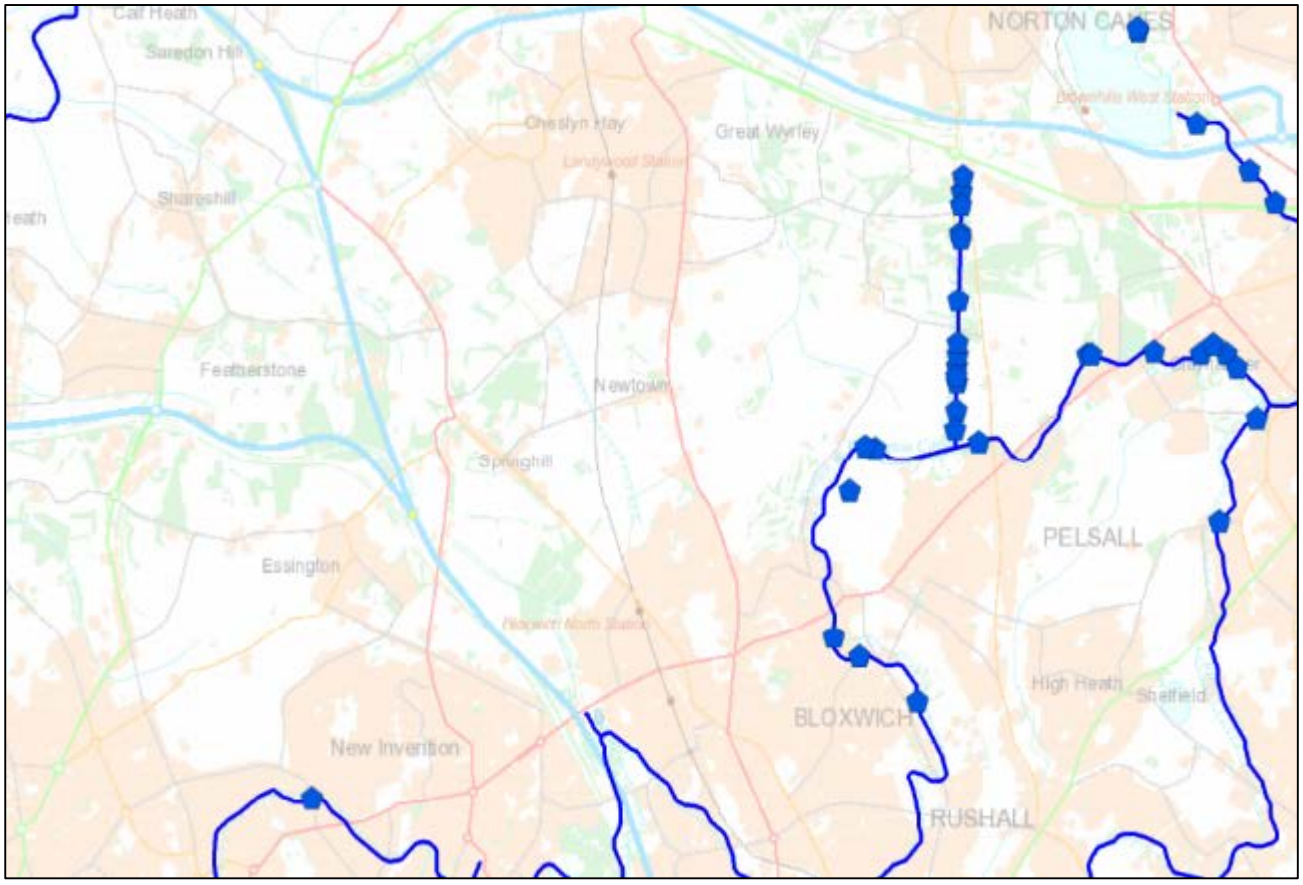

Figure 3.1: Location of Floating Water Plantain within the Wyrley and Essington Canal

The diversity and richness of flora differs significantly between stretches of the Wyrley and Essington canal. Sections of the canal are essentially devoid of richness whilst other areas are enriched with rare aquatic plants. Floating Water-Plantain (*Luronium natans*),* which is on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, thrives between Chasewater and Bloxwich with a further, unconfirmed, report of *L. natans* in the canal in the Wolverhampton area. The species is exceptionally rare within the UK and to be found in such abundance within the W&E Canal conveys a considerable significance upon the location. Figure 3.1 highlights where *L. natans* is currently located on the W&E Canal.

3.1.1.2 Terrestrial and Wetland Plants

The Canal's boundary habitats have a buffering capability that intercepts overland flow, removing much of the sediment, chemicals and nutrients and encouraging infiltration into the soil layers. The offside of Pelsall Common on the W&E Canal benefits from heathland. Heathland is an internationally threatened habitat with significant ecological diversity associated to it. Its ability to afford protection to ground nesting birds, insects and mammals provides heathland with its high ecological significance. It is a key objective of the LNR to

enhance and extend the heathland habitat along the canal, improving both vegetation density and connectivity for wildlife.

Woodlands are climax ecosystems and important for carbon storage, pollution diffusion, providing shade against the potential harmful UV rays as well as providing home to many 1000s of species. Insects utilise woodland for habitat, providing birds and other fauna with a constant food source. Oak trees support a larger group of organisms than any other tree species and are a valuable timber resource making them an important member of the canal ecosystem. Combining oak trees with other tree species, such as fruit trees, will increase the variety of food sources and habitats.

3.1.2 Fauna

3.1.2.1 Mammals

The canal supports many different mammal species. The available habitat has, in the recent past, supported Water Voles (*Arvicola amphibius*),* although the current conservation status is unknown*.* Furthermore, the habitat along the canal is such that it holds the potential to support populations of Otters (*Lutra lutra*)*. A number of bat species use the canal habitat. Populations of Common Pipistrelle (*Pipistrellus pipistrellus*)* frequent the habitat along the canal, although details of the roosting sites and current conservation status are currently unknown*.* The terrestrial edges of the canal provide habitat for the Soprano Pipistrelle (*Pipistellus pygmaeus*)*, and Brown Long-eared Bat (*Plecotus auritus*)* whilst the Daubenton's Bat (*Myotis daubentonii)*, can be found foraging over the canal. Several of the mammal species recorded on the canal have suffered severe declines and are now afforded legal protection. Therefore, waterways need to be managed and enhanced to encourage these species to reside in these areas. The canal network offers a unique opportunity to provide landscape connectivity through both rural and urban regions for a wide diversity of species. Past records of Water Voles offers a focus for conservation effort on the W&E Canal.

3.1.2.2 Birds

Mallards (*Anas platyrhynchos)*, Coots (*Fulica atra)*, and Moorhens (*Gallinula chloropus)*, are common examples of the aquatic bird species that utilise the W&E Canal. Improving the quality of their habitat will enhance these populations. Willow tits (*Poecile montanus**) were recorded along the canal at Clayhanger Common and Sneyd during the 2014 ecological survey (detailed in Appendix 3) carried out by Walsall Metropolitan Borough Council. Furthermore, a Kingfisher (*Alcedo atthis*) was spotted along section 1 Daw End Branch – Becks Bridge and Common Terns (*Sterna hirundo*) are known to breed at Ryders Mere adjacent to Clayhanger SSSI and regularly feed along the canal. Species such as Common Bullfinch (*Pyrrhula pyrrhula*)*, Common Linnet (*Carduelis cannabina*)* and Yellowhammer (*Emberiza citrinella*)* have been identified along the canal and in hedgerows around neighbouring water bodies such as the wetland in Clayhanger. The variety of bird species along the W&E Canal make it a great location for bird watchers and demonstrates that there is ecological diversity that can be developed across the LNR.

3.1.2.3 Reptiles

The habitat along the canal has the potential to support Grass Snakes (*Natrix natrix*)*, Common Lizard (*Zootoca vivipara*)* and Slow Worms (*Anguis fragilis*)* and, indeed,

historical records attest to the presence of these species in recent times. With a decline in suitable habitat, these reptiles are becoming more vulnerable to the effects of human activity. These species significantly benefit the biodiversity of the canal and by increasing the quality and quantity of available habitat it should be feasible to re-establish healthy populations.

3.1.2.4 Amphibians

Many amphibians can be found within diverse regions of the canal. The Common Toad (*Bufo bufo)* breeds in marginal vegetation, the Smooth Newt (*Lissotriton vulgaris)* is found in marginal vegetation and pondweeds and Great Crested Newts (*Triturus cristatus*)* have been identified with a local distribution along the W&E Canal. Great Crested Newts have declined dramatically in the last century and are now protected by European and British law (The Wildlife and Countryside Act 1981). It is therefore a privilege to have these species resident in the W&E canal and they will be an asset to any LNR.

3.1.2.5 Fish

The diverse species of fish that can be found in the W&E canal make it a popular location for anglers. The aim of the LNR would be to ensure that the aquatic habitat is enhanced to maximise the sustainability of fish populations. Creating sustainable fish populations would both allow populations to migrate and colonise new areas of the canal and mitigate the effects of stochastic events. Improvements in fish stocks and distribution would attract angling groups and people from further afield to visit the region.

3.1.2.6 Invertebrates

The W&E Canal was once home to the threatened White-Clawed Crayfish (*Austropotamobius pallipes*).* Figure 3.2, shows the historic locations of native White Clawed Crayfish near Chasewater. This suggests that, in the recent past, the habitat in these regions was able to support viable populations. Competition from non-native Signal Crayfish (*Pacifastacus leniusculus*) is an issue that has been identified at Chasewater reservoir and management is required to prevent this highly-invasive and aggressive species migrating throughout the canal. The primary goal of the LNR will be to establish the presence/absence and the size of any remaining population of the White-Clawed Crayfish within the W&E Canal. Careful management to create suitable habitat for our native crayfish populations to recover within the canal system has been identified as a secondary objective.

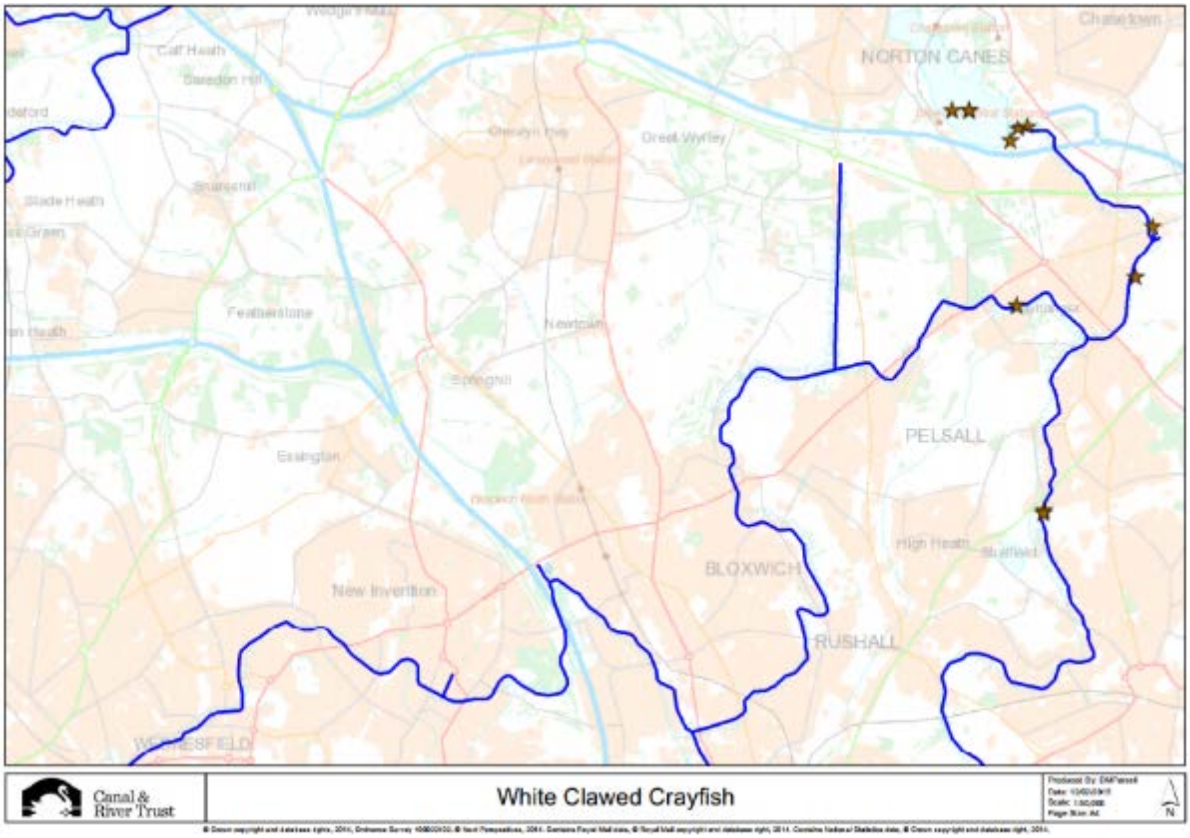

Figure 3.2: Location of White Clawed Crayfish in the Wyrley and Essington Canal

4 Benefits to People and Communities

4.1 Quality of Life

Today we live in a world in which the pace of life is ever increasing. The Wyrley & Essington Canal offers a haven for both the local community and nature alike and, in many areas, this refuge is just a few steps away from our everyday lives. The canal has the potential to have a profoundly positive impact on quality of life allowing individuals the space to reconnect with themselves, the environment and those that matter to them. Once designated as a LNR not only can the canal be protected but it will provide the opportunity to enhance this unique and treasured waterway for the enjoyment of future generations.

4.2 Individual Well Being

The W&E Canal is part of a network of canals across the West Midlands. However, its tranquil, meandering waters see few boats and set it apart from many of the busier canals within the network. To those struggling with the pressures of day-to-day life it is a highly valued place to rejuvenate and take stock. To others the canal is an oasis on the doorstep where they can stretch their legs and soak up 200 years of history. Whatever their motivations the canal has a value to people far beyond aesthetics.

4.3 Individual Physical Health

The W&E Canal is a unique and pleasurable setting in which to enjoy the benefits of physical activity. Walking is one of the most natural and effective forms of exercise. Taking a walk along the canal is not only a way to connect with the natural environment but is also an activity that the whole family can enjoy regardless of age.

The level contours running the length of the canal making it extremely popular with cyclists. Cycling is one of the best forms of aerobic exercise. It is free and again is something that the whole family can enjoy.

Exploring the canal by canoe is also an excellent way to increase or maintain physical fitness and the Wyrley and Essington benefits from a canoe centre situated in Brownhills. Not only does canoeing allow people to get even closer to nature but it also offers a whole new perspective on the canal.

As a LNR it would be possible to encourage the community to make better use of the canal and promote greater physical fitness through the consideration of a number of initiatives. These include the introduction of organised canal walks and adopting designated sections of the canal into the national cycle network.

4.4 Involving people and building stronger and safer communities

Meeting the aims of the Black Country Wyrley and Essington Canal LNR management plan offers the opportunity to build a stronger and more united community through active social involvement. Canal adoption schemes are a proven method for fostering the notion of ownership and can empower the local community to connect with their environment and take

some responsibility for its management. Local groups set up for the purpose of protecting and managing the LNR are both an important resource and a vital social outlet for the community that reduces anti-social behaviour.

The first of these groups, Goscote Greenacres Community Gardens, have recently approached the Canal and River Trust with the desire to adopt a seven hundred metre section of canal between Goscote Hall Bridge and Hildicks Bridge in Walsall. The group operates in partnership with Walsall Council Social Care and Inclusion Department and works with adults with learning difficulties. Importantly, the interest in the Wyrley and Essington canal shown by such groups demonstrates the desire within the community to engage with their environment.

Implementing a programme of social events on the LNR, with an emphasis on children and young people, will further develop the sense of community involvement. Suitable events include Bat walks, nature trails, minibeast hunts and bird box building. Organised by local groups and conducted in accordance with the appropriate health and safety procedures these events can inspire and encourage local people to discover more about the natural and cultural heritage of the canal in a safe environment.

4.5 Environmental education and lifelong learning

The proposed Black Country Wyrley & Essington Canal LNR would benefit from a range of different habitats seldom found together elsewhere. Its length encompasses heathland, grassland, woodland and scrub in addition to the aquatic environment provided by the watercourse itself. As a result the canal supports substantial biodiversity and offers a valuable opportunity for education and study.

Encouraging local schools to visit the canal as a key learning experience is an important goal of the LNR. Such experiences offer educational opportunities not only in relation to the habitats and species found within the LNR but through activities such as tree planting children can learn some of the basic aspects of reserve management.

Work parties drawn from the local community and outside organisations can also provide people with the opportunity to learn new skills and develop an understanding of nature conservation management. Dedicated workshops looking at aquatic biodiversity and plant identification, for example, can prove to be an important learning resource for those with a specialist interest in ecology.

As an LNR the Wyrley and Essington Canal could offer a site for scientific research by university students from across the area. Such opportunities not only facilitate improved working relationships with educational institutions but the results from potential studies may be able to assist in the successful management of the LNR and should be encouraged and supported as far as possible.

5 Management

5.1 Initial Investigations

5.1.1 Ecological Surveys

Ecological surveys have been completed by both City of Wolverhampton and Walsall Metropolitan Borough Council in 2013 and 2014 respectively. The presence of species identified during the course of these surveys are documented in Appendix 6 and 7. Both surveys independently highlighted the presence of native and invasive species along the full length of the canal. As an important benchmark to the success of the LNR these surveys should be completed annually and the results compared year-on-year. Students, willing to volunteer their time, from the nearby Wolverhampton University may provide a useful resource in carrying out future surveys.

All invasive floral species should be controlled and treated following the guidance provided by the Environment Agency on the use of herbicides near water. Strict controls on invasive species within the LNR will raise public awareness of the issues and encourage the proliferation of native and protected species. Again, students from the nearby university could prove a useful resource.

5.1.2 Length Inspections

Tasked with walking the length of the canal, length inspectors identify any engineering faults or related issues. During such surveys length inspectors will also document any obvious issues with invasive species or environmental crime. Furthermore, in the case of the Wyrley and Essington Canal, length inspectors will also map the quantity and quality of the bankside vegetation and locate areas in need of management.

Assessing the current quantity of grassland and vegetation on the towpath can be completed following the length inspections. With this data it will be possible to extrapolate the absorption ability of the entire embankment and to assess the potential impact that replacing the existing grassland with an impermeable surface will have on the canal and any flood events. Length inspectors will also record the condition and nature of the canal bank. This will facilitate an assessment of the most appropriate mowing regime.

5.1.3 Soil Sampling

Soils should be sampled every 600 metres, at specified locations, along the full length of the canal in order to calculate the pH and chemical and nutrient content. This data can then be used to tailor the management plan to ensure that vegetation is planted in areas offering optimal growth and that mowing regimes are altered to support this. Taking the time to complete this analysis should avoid a situation where capital is invested in planting strategies that ultimately fail. Furthermore, the results of the soil analysis can be used to highlight the impact of historic industrial practices on the local environment.

5.2 Management Plans

5.2.1 Bankside

5.2.1.1 Mowing Regimes (Grassland)

The current mowing regime adopted along the Wyrley and Essington Canal is classified as MR2A (defined within figure 5.1 below).

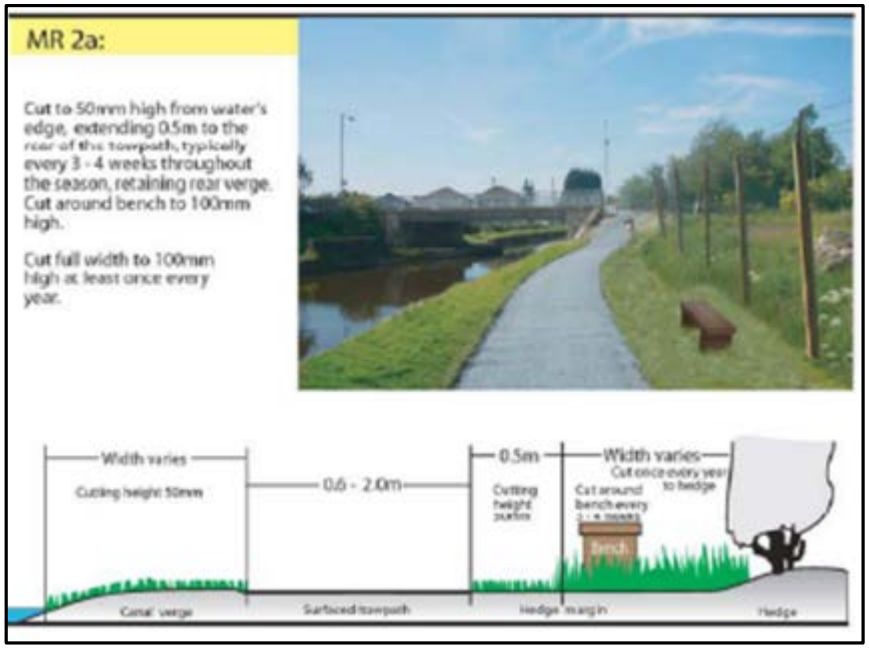

Figure 5.1: Definition of the MR2A mowing regime

In the past designated sections of tow path and bankside vegetation have been mown in accordance with the MR2B specification (outlined in figure 5.2 below). However this strategy proved to be problematic and was subsequently ceased.

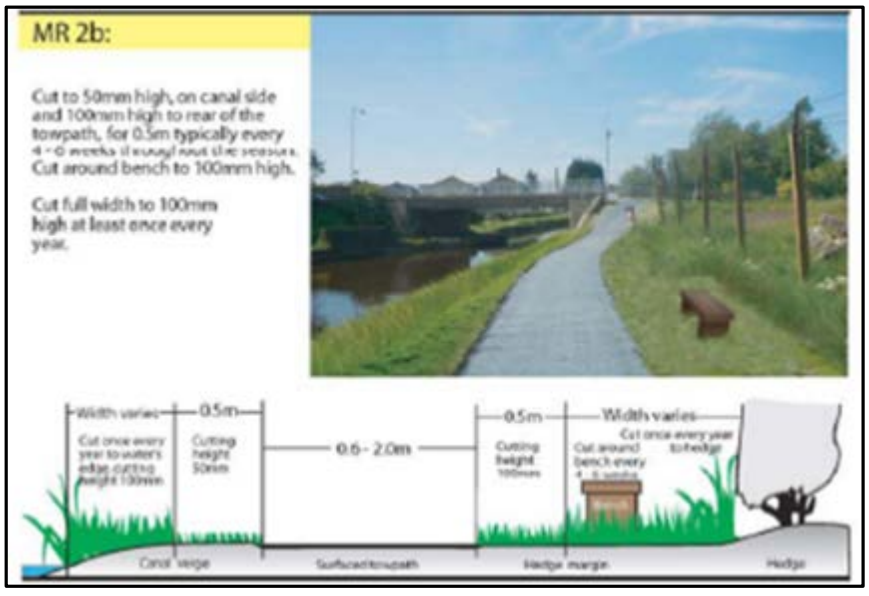

Figure 5.2: Definition of the MR2B mowing regime

Determining the appropriate mowing regime will be based upon the results of the soil sampling exercise undertaken as part of the management plan. This data can be used to identify areas where excessive vegetation growth is likely to occur and where mowing can be relaxed. In addition, assessment of the bankside characteristics during length inspections will be used to determine the correct mowing strategy. In areas of brick-lined banking, prone to excessive growth, mowing will follow the MR2A regime. This will prevent any excessive growth that could restrict access to the towpath for boaters in an emergency or cause damage to the canal banks. In regions of soft banking and where excessive vegetation growth is less likely to occur mowing will follow the MR2B regime. The reduced disturbance associated with the MR2B protocol will benefit certain species of flowering and seeding plants, as well as species that could be inhibited by the lack of continuous vegetative cover such as Water Voles and Reptiles.

The mowing regime currently implemented on the nearby Cannock Extension SAC is classified as MR3A (defined in figure 5.3 below). This strategy has proved excellent for biodiversity and it is hoped that adopting the MR3A regime on appropriate stretches of the Wyrley and Essington Canal LNR will offer significant benefits in terms of species ecology.

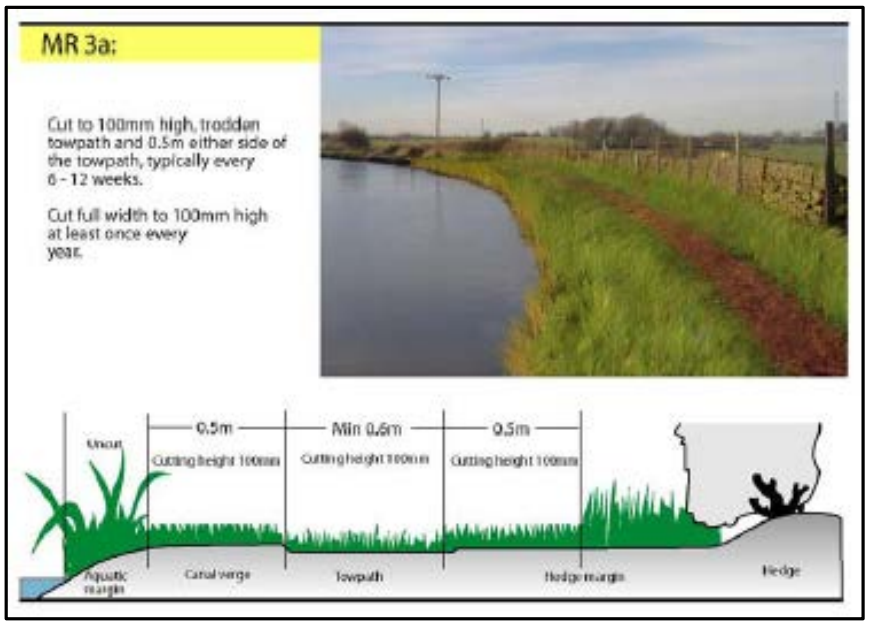

Figure 5.3: Definition of the MR3A mowing regime

5.2.1.2 Towpath

The towpaths alongside the canal should be of a sufficient standard to facilitate the diverse activities of its users in safety whilst protecting the environment.

The width of the towpath is proportional to that of the overall canal bankside. The benefits of maximising towpath vegetation are generally acknowledged and the implications of removing vegetation from the towpath in preference for hard surfaced towpaths can be statistically analysed once length inspections have been completed. The results of this analysis can then be used to determine the optimal towpath width and surface material to meet both user and

ecological expectations. This template can then be applied to the LNR to identify areas of towpath along which the vegetation can be enhanced.

Where issues such as poor drainage have degraded the quality of the towpath, alternatives to hard surface implementation should be considered in the first instance. Towpath regrading is a proven method of improving drainage. Where the only feasible solution appears to be replacing the existing towpath with a hard wearing surface, alternatives to tarmacadam should be favoured in accordance with the towpath guidance issued by the Canal and River Trust. Such alternative materials have successfully been used on the Grand Union Canal and demonstrate that viable alternatives to hard surfaces do exist.

5.2.2 Boundary Vegetation

Boundary vegetation is an essential means of enhancing ecology, protecting water bodies and improving the overall appearance of a water way. A continuous buffer of riparian vegetation can reduce the amount of sediments, particles and excess water entering the canal, improving the aquatic ecology. It can also remove the harshness of urban barriers, enhancing the experience for local communities and visitors whilst providing increased habitat. Increased vegetation will also help to prevent flooding incidents by intercepting surface runoff and encouraging infiltration into the soil.

The natural buffer created by boundary vegetation is particularly important in the area of Walsall farmland that backs onto the canal. Improving the riparian land in these areas will mitigate the runoff of chemicals applied to the agricultural land into the canal safeguarding water quality and ecology.

5.2.2.1 Hedges

The surveys carried out by the length inspectors will provide a full picture of the locations and quality of hedgerows within the LNR. Works aimed at enhancing the hedgerows can then be prioritised accordingly. Such works will focus on extending the height of the hedgerow, bringing previously unmanaged hedgerows under control and increasing diversity. Gaps in existing hedgerows should be restored using appropriate native species to encourage connectivity. Connectivity and biodiversity along the length of the canal can be improved further by planting new hedgerows along suitable sections of the LNR.

5.2.2.2 Heathland

One of the key objectives of the LNR management plan would be to enhance and extend the heath land around Pelsall North Common and Chasewater. Guided by the results of the soil sampling exercise and using the existing habitat as a seed source the heathland would be extended along the canal towpath or boundary. As one of the rarest habitats in the UK, developing the heathland will not only add ecological value to the LNR but will offer a unique selling point that will attract visitors. However, heathland is extremely vulnerable to disturbance through trampling, soil enrichment and accidental fire and therefore available public access should be balanced with appropriate methods to protect the habitat.

5.2.2.3 Trees

Research demonstrates that trees bring a wealth of benefits both ecologically and in terms of public health and economic benefits. From a public health and economic perspective trees can improve air quality, providing shading, buffer environmental pollutants and offer a degree of natural flood defence by absorbing vast qualities of water. Ecologically, woodlands are important factors in the improvement of habitat and food sources for a variety of species. The number of oak trees, for example, has grown steadily and represents an important resource within the canal ecosystem, which should be maintained through careful management.

As a general rule, the spatial restrictions imposed by the nature of the bankside mean that, in most cases, areas of woodland are not feasible. The focus of the LNR management plan will on enhancing connectivity along the canal. The quality and quantity of species assemblages associated with trees and shrubs is highly dependent upon species and spatial distribution (Appendix 5). A variety of different tree species should be planted along hedgerows to allow migratory species, such as bats, to locate suitable habitat regardless of their position along the canal. This would allow these species to migrate along the length of the canal, seeking out the most suitable habitat. Furthermore, planting a variety of tree species will offer broad resource benefits encouraging biodiversity. Establishing a mosaic of shrubs, wild flowers and bare ground as well as introducing a management regime that promotes structural variation in the vegetation can offer alternative habitat and boost biodiversity.

Sites identified for potential tree planting will be assessed for suitability via soil sampling, the current ecology of the surrounding habitat and the width of the bankside. The presence or absence of certain ecological indicators (Appendix 1) will also prove a useful consideration. At locations where tree planting is not appropriate, for example, narrow bankside areas, hedgerows and heathland will be considered as alternatives.

Enhancing connectivity will result in the restoration of previously fragmented habitats. The tolerance to stressors of individual species will increase as each benefits from greater genetic diversity, improved resources and a heightened carrying capacity. Not only will the greater biodiversity benefit the natural environment but it will also attract more visitors interested in seeing the high variety of species along the canal. The result would be a LNR that is cleaner, healthier, offers a more sustainable environment and successfully supports a wide variety of species as well as linking both local people and the wider community to nature.

5.2.3 Offside

The offside of the W&E Canal is primarily private land but it is important to consider this as part of the management plan. Ecology does not recognise boundaries and as a result providing stable and consistent habitat within the LNR requires careful management across these boundaries. It is important that areas where the diversity of wildlife can be improved are quickly identified. The creation of marginal strips along canal walls and buffer strips along agricultural land will help improve the overall quality of the canal and encourage the associated ecology.

5.2.3.1 Tree management

The manner in which trees along the LNR are managed can have a direct impact upon the ecology of the canal. Shading can have both a positive and negative effect. For example, high levels of shading can deleterious effect on biodiversity and degrade marginal habitats such as that preferred by the Water vole. In contrast, appropriate shading can provide shelter and habitat for foraging and spawning in fish. The trees lining the canal should managed either to the water's edge or to within one metre of the channel. Whilst either of these methods maybe adopted it is recommended best practice to manage using a combination of the two strategies. Effective management should prioritise the removal of dead, dying and diseased trees where these compromise other important habitats or navigation.

5.2.3.2 Restore old arms

By their very nature the historic arms along the canal can offer a different habitat to that of the main channel. Implementing different management techniques within each of the three arms at Clayhanger (as shown in figure 5.4 below) could enhance this diversity ever further. Some of the arms appear filled in while others contain a greater proportion of water and, at present, their current ecological value is not understood. As a first step, it is essential that the canal arms are surveyed to determine their current ecological value. It is only once this step has been completed that a full assessment of the potential ecological value of the canal arms, once restored, can be determined.

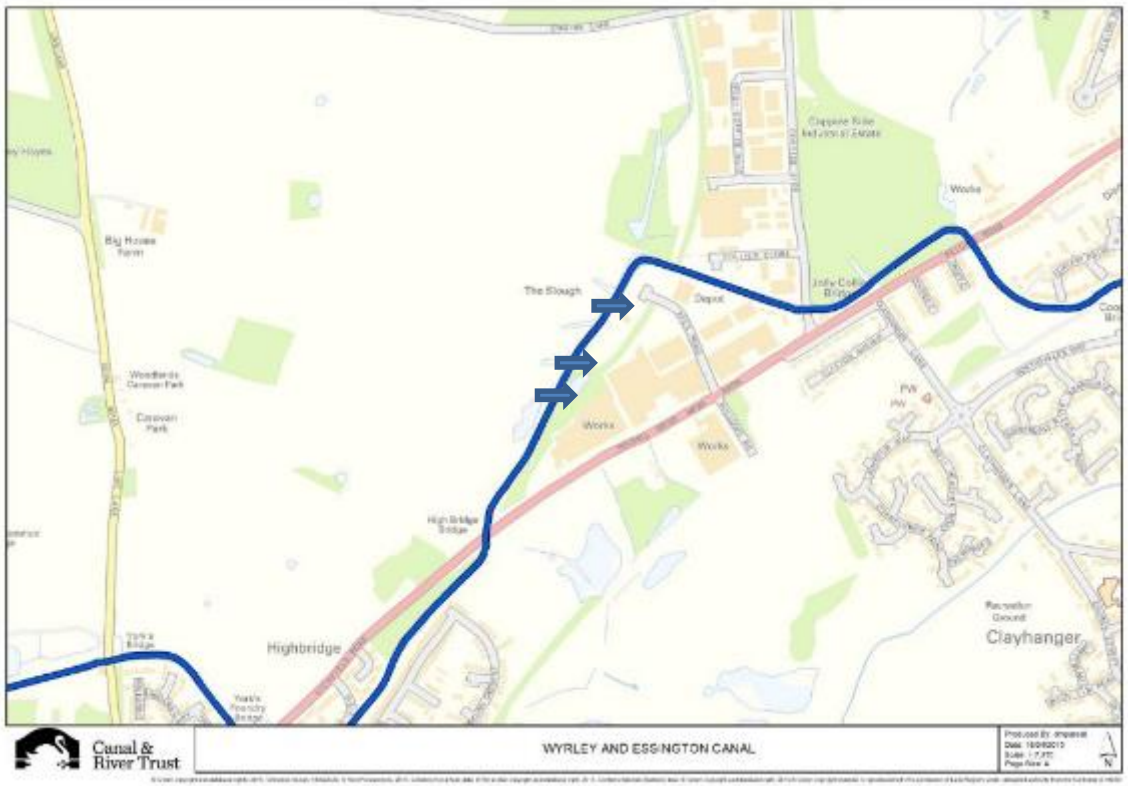

Figure 5.4 Three historic arms on the Wyrley and Essington Canal at Clayhanger

Canal arms that are both filled in completely or partially water filled can be cleared of trees to allow sunlight to penetrate. This will allow shrub layers to establish, varying the available habitat. If the composition of the sediments proves to be non-toxic then dredging can be used to open up the arms. Aquatic vegetation such as native reeds should be planted where the arm and the main channel converge. This will lead to the development of different zones of water movement. In theory it should be possible to transfer Floating Water Plantain that has become well established within the Cannock Extension canal to the canal arms. While this would prove beneficial to both the abundance of Floating Water Plantain and add to the overall ecological value of the LNR, the licencing and legislative implications would need to be fully understood before undertaking any project to this end.

5.2.4 In channel

5.2.4.1 Restoring sheltered areas

Areas of the canal where there is insufficient shelter will have a negative effect on the populations of fish and other aquatic species. It is essential, therefore, that some sheltered areas are restored balanced against the requirements of the aquatic plant species already established in the area. Increasing emergent vegetation will offer wildlife valuable habitat and a place to shelter from prey. Furthermore, employing soft bank management strategies such as installing coir roll will enhance vegetation and provide shaded habitat for mammals and aquatic species. While this vegetation will require careful management to prevent any extensive growth impacting boaters, it will both benefit water quality by removing nutrients and a stabilise sediment on the canal bed.

5.2.5 Economic Benefits

Attractive economically functioning areas are proven to benefit the local economic outlook. Ultimately the goal of the LNR is to provide an attractive, ecologically significant natural resource that is valued by the local and wider community and provides economic benefits. Statistics relating to footfall and boating activity will be used as a key performance indicator of how successful the LNR has been in encouraging people to visit and interact with their environment. Statistical information relating to the use of the LNR will be collected using electronic counters installed along the length of the canal. The information provided by these devices will be used to identify different user groups, the frequency of usage and the periods of peak activity.

5.2.5.1 Interpretation

The interpretation and signage within the LNR should consist of signs announcing the LNR and displaying the route and boundaries of the site, to both inform users and engage them in its rich natural and industrial heritage. All signage should be clear, concise and installed as part of a coordinated approach across the site without being intrusive or detrimental to either the character of the LNR or the wildlife/habitats for which it is designated. The enhanced interpretive provision across the LNR will prove beneficial to educational groups undertaking visits to the site.

Many private services operate along the length of the canal and it would be useful to signpost their locations on the maps. Care should be taken to ensure that the Canal and River Trust are not perceived as advertising any private business regardless of ownership or tenancy.

Facilities owned by the Canal and River Trust are currently reserved for its members, however there is potential to open these facilities on the LNR to the public. This does entail additional overheads for the trust in the form of increased maintenance and cleaning costs. There is also a greater risk of vandalism. One possible approach to address these concerns would be to make toilets accessible by coin donation.

5.2.5.2 Access

Improving the quality of the canal towpath is an essential component in ensuring the LNR is available to all. The condition of the existing towpath should be assessed and the data from the surveys used to prioritise works to enhance the towpath quality. Improvement works should be carried out sensitively using environmentally friendly alternatives to hard surfaces wherever possible. Where hard surfaces are identified as the most suitable solution the environmental impacts should be carefully considered.

The locations and quality of access points and 'honey pot' locations should be assessed through surveys. This information can then be used to generate a strategic plan aimed at improving access for the community, promoting a healthier lifestyle and encouraging interaction with the environment.

Environmentally sensitive areas within the LNR should be protected from the effects of increased footfall through 'zoning'. This will allow the ecology to develop free from the disturbance caused by the increased human interaction.

5.2.5.3 Technology

Using technology effectively can enhance the visitor experience and reduce the costs associated with interpretation. Perhaps the most obvious application for technology lies in the use of official websites. The websites of the Canal and River Trust, City of Wolverhampton Council and Walsall Metropolitan Borough Council can be used as a source of valuable information. They can be used to relay information both to users of the LNR and the wider community as a whole. Information on the reserve, the wildlife, forthcoming events and the latest news can all be made available on-line. Furthermore, allowing people to sign-up to receive the latest news and information via email is a simple and cost effective means of fostering engagement and ownership of the reserve.

The use of QR codes can allow visitors to access a wealth of information including historical background, key facts, walking and cycling route information and interactive activities. Furthermore, providing QR codes is an efficient means of reducing the amount of textual information required on interpretation boards. Employing technology in this way also carries

a financial benefit through a reduction in the size and number of information boards required along the canal.

6 Factors that may impact on the success of the LNR

6.1 Physical

6.1.1 Maintenance/Structural

As a legacy of the canal's industrial past there are many buildings and other structures along its length. Length inspectors carry out regular inspections of the waterway during which any potential issues relating to the waterway, towpath or associated structures will be identified and reported. The local length inspectors are among the first Canal and River Trust teams to directly observe and record any issues on the canal. In addition to monitoring assets and towpaths the teams visually assess and monitor invasive species, engineering issues, areas where project works have been conducted and any environmental enhancements. This activity is particularly important in preventing any structure or invasive species having a detrimental effect on the canal infrastructure, especially where this may ultimately lead to a breach in the canal bank.

Were such a breach to occur the impact on aquatic and terrestrial species could be significant. The associated loss of habitat and resources can reduce a species tolerance to environmental factors. For example, an aquatic species living in the benthic zone may not be able to tolerate changes in the light levels resulting from the decreased water volume in the canal. Furthermore, there would be a significant cost associated with a repair, as well as a risk of causing further damage to property or life. In light of this, the banks and structures along the canal are inspected regularly and any repairs that are required are carried out by Canal and River Trust engineers.

Structures, buildings and associated assets can provide habitat for a number of species and can prove to be particularly important to bats. Before any works can be carried out a structure must first be assessed by an ecologist to determine the likelihood of disturbing any species that maybe present. In some cases a degree of mitigation maybe appropriate and this will usually involve the provision of bat and bird boxes.

6.2 Chemical

6.2.1 Point Source Pollution

The Environment Agency are charged with responding to incidents of pollution. The Canal and River Trust do respond to pollution incidents and spillages on their land and waterway network and will work closely with the Environment Agency to lessen the resulting environmental damage. As the Canal and River Trust leases many sites and buildings adjacent to the canal they are able to closely monitor any activities conducted by the tenant that may result in a potential pollution incident, particularly where this involves outflows into the waterway. Discharge points are surveyed by the Canal and River Trust environmental science team and subsequently plotted on GIS for monitoring. This allows the sources of pollution to be readily identified using the mapping software (Figure 6.1).

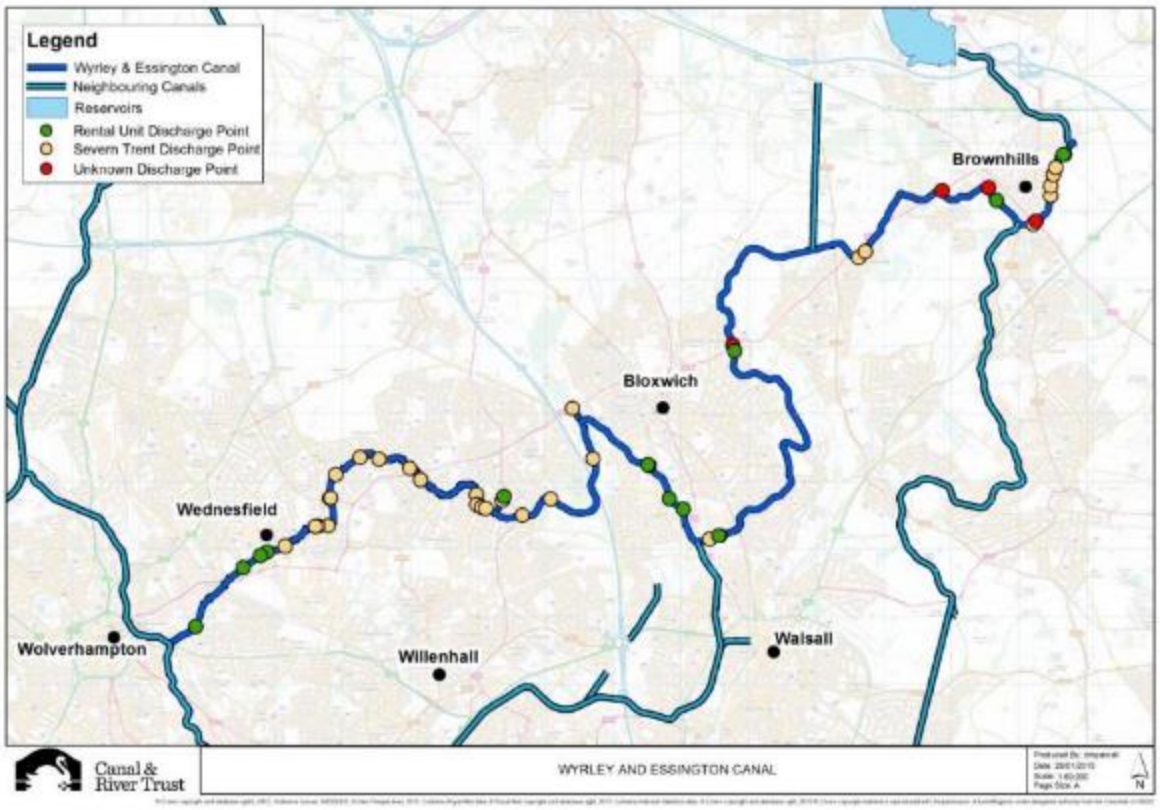

Figure 6.1: Discharge points along the Wyrley and Essington Canal

6.2.2 Pollution (Diffuse)

Diffuse pollution occurs when chemicals and nutrients are leached from the soil and enter the water course as a result of local land use practices. As the pollutants may have been transported from a point of original anywhere within the catchment identifying the exact source often proves impossible. The issue is a major challenge requiring a landscape approach and the close cooperation of local partners within the community in order to tackle the problem at source. For generations human populations have manipulated the landscape for economic benefit. Unfortunately such activity has resulted in deforestation, the removal of riparian land affecting the drainage properties on the land. This makes waterways such as the Wyrley and Essington Canal vulnerable to diffuse pollution carried by overland flow.

In heavily urban and industrial areas sediment, nutrients, metals, hydrocarbons and oils from vehicles could all be carried on hard, impermeable surfaces such as roads and large tarmacked areas. Rural areas, rich in farmland, are sources of organic matter which can be transported into the water course through runoff. Once within the water column such organic matter can have a detrimental effect on biological communities as oxygen concentrations within the water are reduced. In order to prevent this situation occurring within the Wyrley and Essington Canal riparian vegetation will be encouraged throughout the LNR.

6.3 Biological

6.3.1 Invasive Species

An invasive non-native species is any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, or human health.

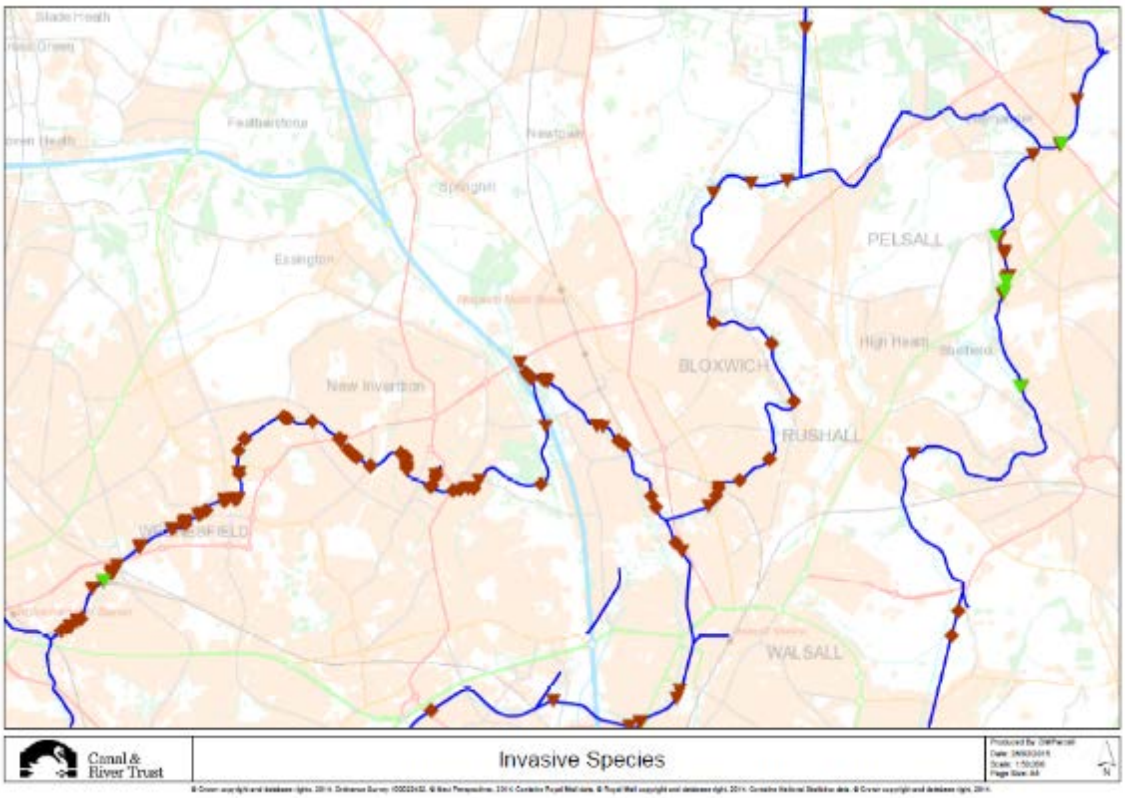

Figure 6.2: Recorded distributions of invasive species on the Wyrley and Essington canal

As illustrated in figure 6.2 above, the majority of invasive species along the canal are found with the more heavily urbanised regions, particularly those in the vicinity of Wolverhampton. Floating Pennywort (*Hydrocotyle Ranunculoides*) and Japanese Knotweed (*Fallopia Japonica*) are especially abundant within these areas. Any work carried out on the waterway could influence and encourage the spread of invasive species and any planned works should consider the strategy for dealing with invasive species.

The canal should be surveyed to establish which areas contain the highest concentrations of invasive species. Teams of volunteers can then be organised to remove the invasive species in accordance with best practice. With the invasive species removed, native flora and fauna will have the opportunity to colonise and establish themselves. Not only will this improve the aesthetic value of the LNR but the ecological quality of the reserve will also benefit. This, in turn, will encourage the community to visit and enjoy the LNR in greater numbers.

6.4 Climate Change

The changes in the environment brought about by climate change are likely to have a profound impact on biodiversity as well as changing the established habitats and niches of resident species. In the past two hundred years, rainfall has decreased in summer and increased in winter and there have been more storms and fewer rainfall events. Average temperatures have increased by 0.6^{o}C since the 1900s strengthening the 'urban heat island' effect in large towns and cities. Such changes not only alter the natural cycle of organisms but also have a negative impact on the habitat in which they survive. Likewise, high rainfall events will alter the quality and composition of the water column as sediment is transported and deposited in greater volumes of run off affecting the habitat for aquatic organisms and those terrestrial species that rely upon the resources they provide.

The Black Country Wyrley and Essington Canal LNR potentially has an important role to play in the mitigation of the harmful effects of climate change both ecologically and in terms of public and economic health. The natural characteristics of the LNR make it an important wildlife corridor helping species to migrate and adapt to climate change. The canal has a valuable role to play in maintaining a safe and healthy environment for people by managing both the dispersal of flood waters and maintaining water quality. In addition, the wooded areas forming part of the LNR provide increasingly valuable shade and maintain air quality.

If vital habitats and water quality are maintained, then the resources upon which so many species depend can be protected. Rich habitats can help to ensure that species populations are maintained affording them some degree of resilience to the ongoing changes in their environment. Undertaking projects such as the riparian land enhancements will increase habitat variety whilst ensuring the level of organic particulates entering the water column are kept to a minimum.

7 Appendix 1 – Black Country Wyrley and Essington Canal LNR Management Plan – Habitats Regulations Assessment

Introduction

This appendix consists of a Screening and Appropriate Assessment of the Black Country Wyrley and Essington Canal Local Nature Reserve Management Plan, as required under the Conservation of Habitats and Species Regulations 2010. The purpose of this section is to determine whether the proposed policies within the draft plan, alone or in combination with other plans and projects, are likely to have an adverse effect on the integrity of any Natura 2000 Site (Special Area of Conservation, Special Protected Area or Ramsar sites).

The Habitat Regulations Assessment process is divided into three main stages:

- Stage 1: Screening – An assessment to determine which Natura 2000 sites might potentially be affected and which policies may potentially affect them.
- Stage 2: Appropriate Assessment – Identifying how each policy might have an effect and the consideration of mitigating factors.
- Stage 3: Mitigation measures and alternative solutions.

Stage 1: Screening

The Black Country Wyrley and Essington Canal Local Nature Reserve Management Plan is an over-arching strategy document for the management of the canal following designation as a Local Nature Reserve (LNR). It aims to deliver co-ordinated strategies and actions supported by a number of key stakeholders.

The plan has the potential to affect just one Natura 2000 site, namely the Cannock Extension Canal SAC. The characteristics of this site are summarised in table 1 below.

Reference	Title	Total Area (ha)	Annex I Habitats (Primary)	Annex I Habitats (Qualify)	Annex II Species (Primary)	Annex II Species (Qualify)
UK0012672	**Cannock Extension Canal SAC** The Cannock Extension Canal extends from Pelsall Junction on the Wyrley and Essington Canal, north to Norton Canes Docks. The low volume of boat traffic on this terminal branch of the Wyrley and Essington Canal	5.0	0	0	1	0

	has favoured open-water plants to flourish, while depressing the growth of emergent. The designation reflects the presence of large populations of floating water-plantain *Luronium natans* that occur in the Canal, along with a diverse aquatic flora and rich dragonfly fauna.					

The potential positive, negative and neutral outcomes of each of the objectives within the Black Country Wyrley and Essington Canal LNR Management Plan have been assessed and are considered below.

Stage 2: Appropriate Assessment

The Habitat Regulations require consideration of other strategies underpinning the outcomes of the Management Plan, in this particular case the Birmingham and Black Country Biodiversity Action Plan (BAP). Therefore, the assessment below takes into account the underlying aims of the BAP that have contributed to the objectives set down in the Management Plan.

For each objective the rationale for the Stage 1 Screening assessment is provided, and where Stage 1 has identified potential impacts the nature of those potential impacts are identified. The assessment then identifies any existing measures likely to mitigate potential impacts and, where necessary, identifies any additional mitigation measures required.

Central to the Black Country Wyrley and Essington Canal LNR Management Plan is the vision statement which states:

- "*The vision for the Wyrley & Essington Canal is to improve the awareness and use of the canal as a site for both recreation and education within the local community whilst protecting, and wherever possible enhancing, its natural beauty and rich biodiversity*."

In considering this vision the objectives and actions within the plan will, for the most part, contribute positively to Natura 2000 objectives, and, at worst, have no detrimental effect on them.

<u>The likely effects of the Wyrley and Essington LNR Management Plan on Natura 2000 sites</u>

Objective 1: Nature Conservation

Many of the actions relating to nature conversation will have positive benefits in reinforcing the importance of conserving the Natura 2000 site connected to the proposed Black Country Wyrley and Essington Canal LNR. Measures to conserve and enhance cultural heritage features will frequently

complement nature conservation objectives and further reinforce the importance of conserving the Natura 2000 site.

The priorities for biodiversity conservation and enhancement measures are set out in more detail within the Birmingham and Black Country Biodiversity Action Plan. These priorities make a significant positive contribution to sites across the Birmingham and Black Country Area including the proposed Wyrley and Essington Canal LNR and the Natura 2000 site connected to it.

No significant negative impacts associated with nature conservation have been identified.

Objective 2: Ensuring Easy Access for the Community

Measures designed to increase visitor numbers and the associated infrastructure could potentially impact adversely upon the Natura 2000 site which might receive greater visitor numbers. Experience suggests that such situations are rare, with relatively insignificant proportions of the total area of SSSI sites nationally designated as being in an unfavourable condition as a result of recreational pressure. The objectives of the proposed Black Country Wyrley and Essington Canal LNR Management Plan incorporate the requirement for measures to be sustainable and consistent with Local Nature Reserve purposes, thereby ensuring that compliance with Natura 2000 objectives is an inherent consideration.

Furthermore, a central ethos of the proposed Black Country Wyrley and Essington Canal LNR Management Plan is to actively encourage the community to become activity involved in the conservation and protection of the Canal and associated landscape that make up the LNR. Measures, such as volunteering, can involve the community in the conservation and protection of the LNR and will, undoubtedly, have a positive effect upon the Natura 2000 site.

While an increase in recreational pressure could have a negative effect, adequate management of towpaths and footpaths as well as restricting access to ecologically sensitive areas may actually have a positive effect upon the Natura 2000 site.

Objective 3: Improving and Enhancing Opportunities for Walking, Cycling and Boating

Encouraging community engagement by offering greater recreational opportunities is likely to have positive benefits on the Natura 2000 site connected to the Canal. Conversely, any significant increase in the level of boat traffic navigating the Natura 2000 site could have a negative effect. However, as the Cannock Extension Canal SAC is a relatively short, terminal branch off of the Wyrley and Essington Canal any increase in traffic is unlike to cause sufficient disturbance to negatively impact upon the abundance of *Luronium natans* present within the channel.

Conclusions

The Stage 1 (Screening) and Stage 2 (Appropriate Assessment) assessments above indicate that most of the Objectives and Actions within the Management Plan are compatible with, and unlikely to have a significantly negative impact upon, the Natura 2000 site. Moreover, many of the objectives are likely to have a positive effect. Where there is the potential for negative impacts, these can be adequately addressed through management arrangements.

The conclusion of this Habitats Regulations Assessment is therefore that the proposed Black Country Wyrley and Essington Canal LNR Management Plan will not have an adverse effect on the integrity of

the Natura 2000 site, and is therefore compatible with the Conservation of Habitats and Species Regulations 2010 and the European Habitats and Species Directives.

8 Appendix 2 – Detailed Black Country Wyrley & Essington Canal LNR Maps

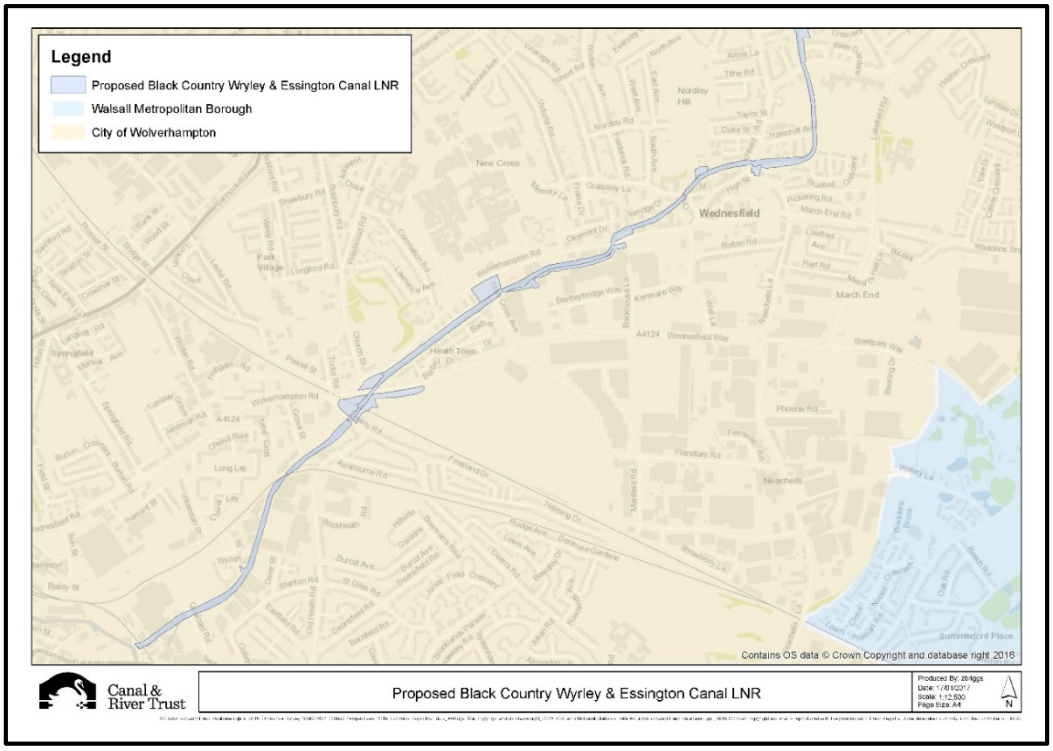

Figure 8.1: Proposed Black Country Wyrley and Essington Canal LNR running through Wolverhampton from Horseley junction to Wednesfield

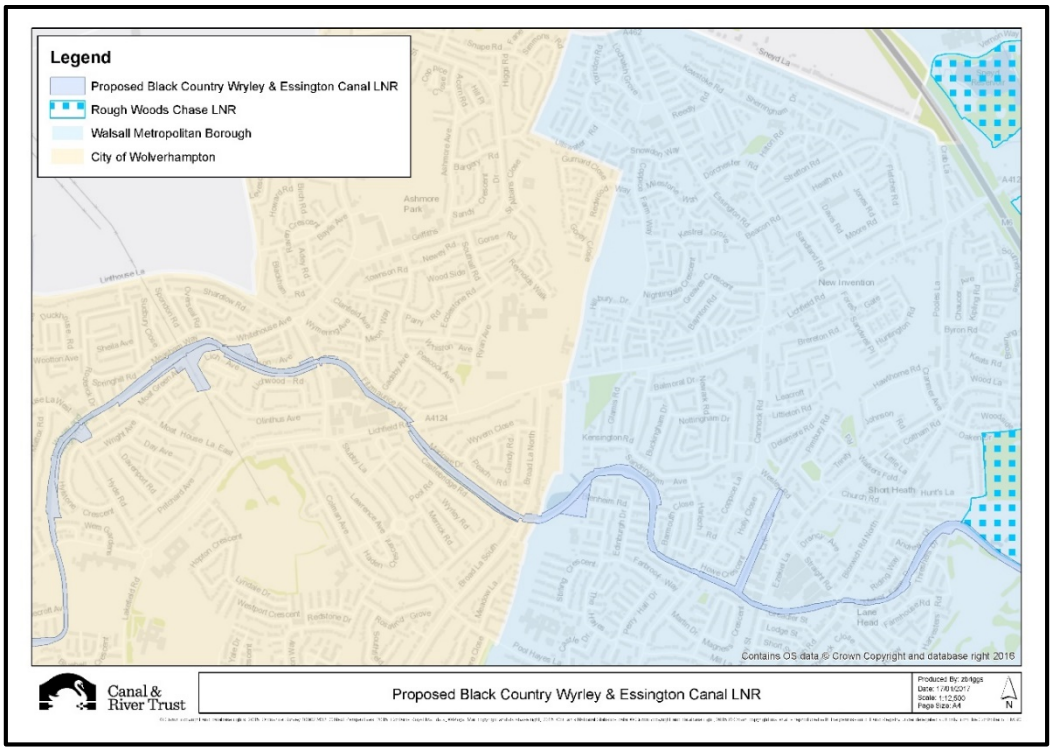

Figure 8.2: Proposed Black Country Wyrley and Essington Canal running from Wednesfield in the City of Wolverhampton authority area to Rough Wood Chase LNR in the Walsall Metropolitan Borough authority area.

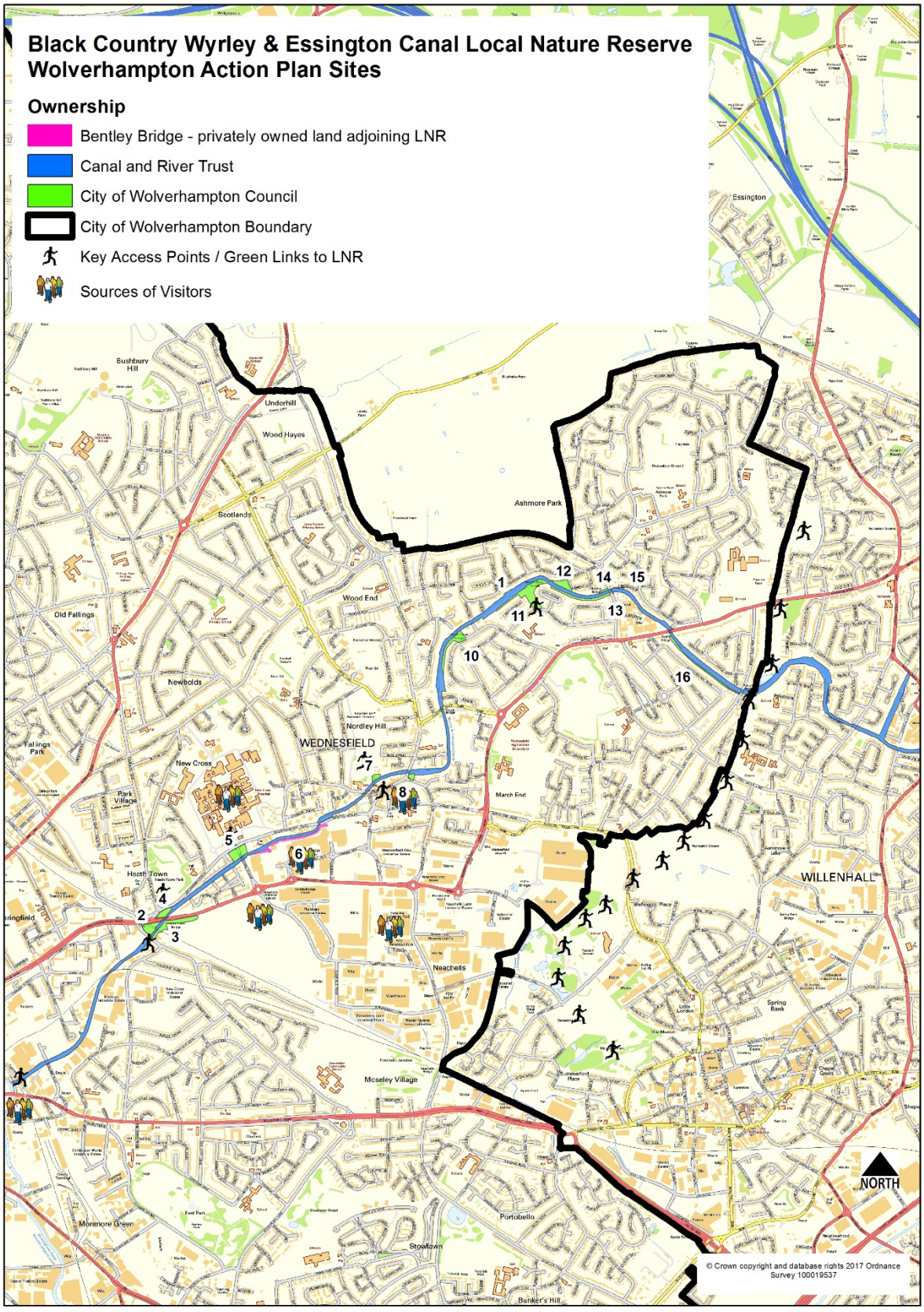

Figure 8.3: Proposed LNR boundaries and ownership within Wolverhampton City Council authority area

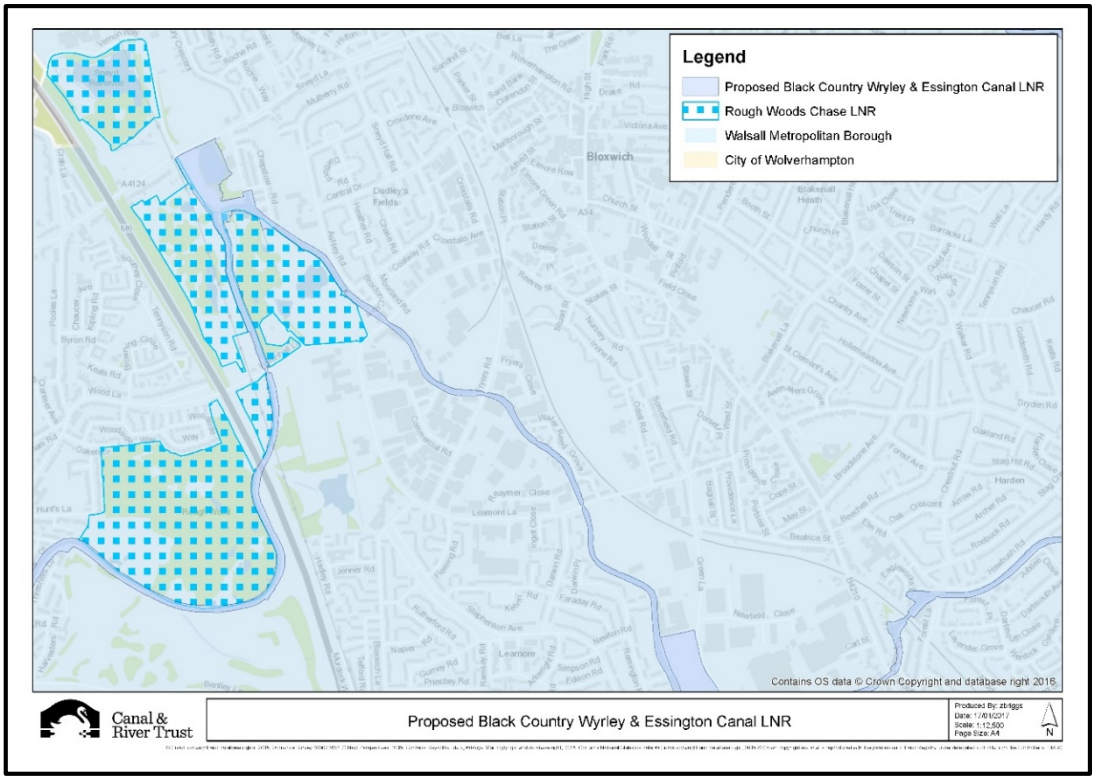

Figure 8.4: Proposed Black Country Wyrley and Essington Canal running from Rough Wood Chase LNR to Jubilee Close in the Walsall Metropolitan Borough authority area.

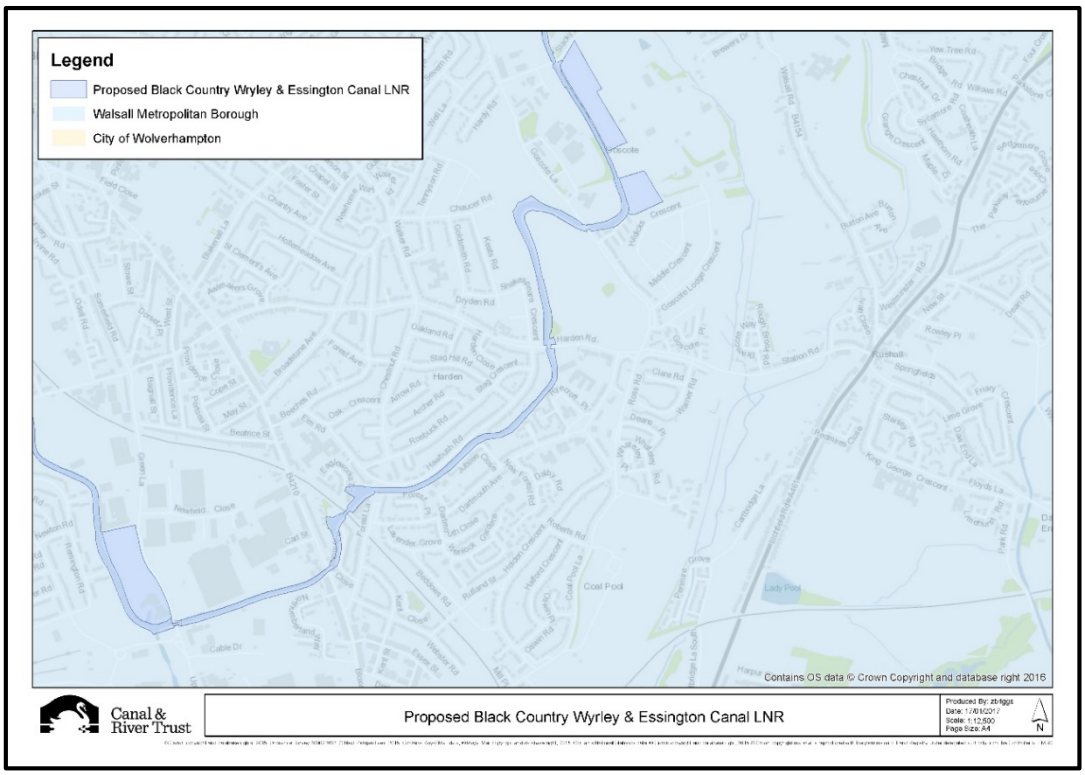

Figure 8.5: Proposed Black Country Wyrley and Essington Canal running from Remington Road to Goscote in the Walsall Metropolitan Borough authority area.

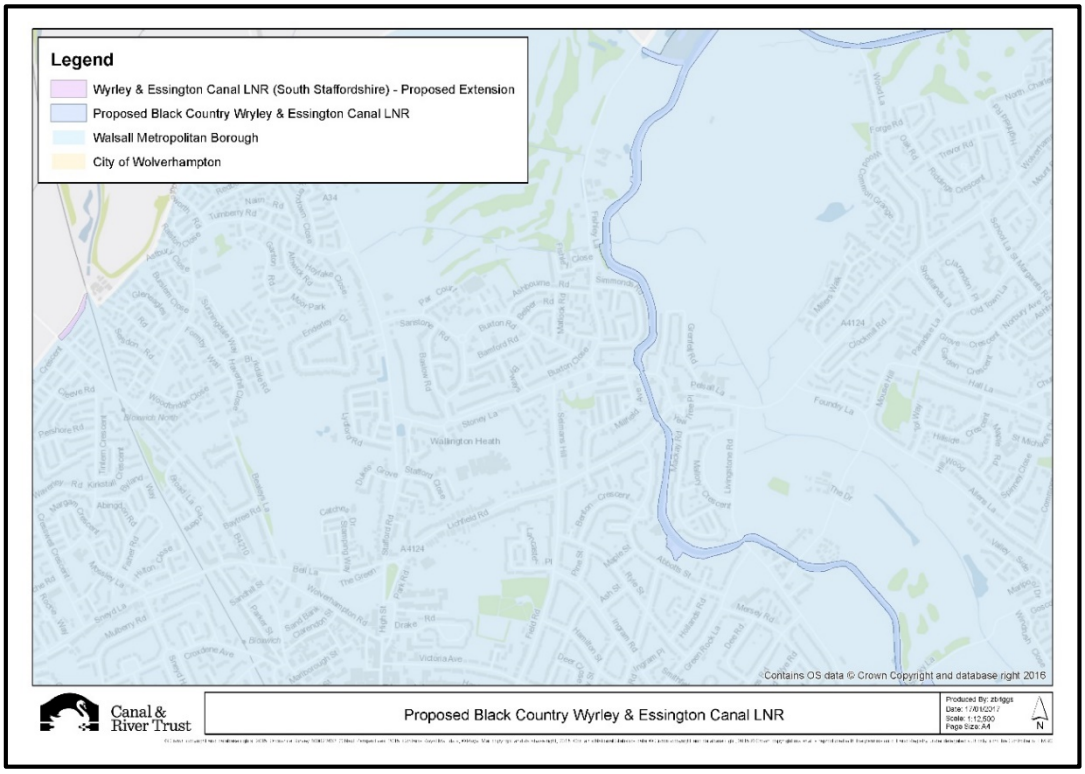

Figure 8.6: Proposed Black Country Wyrley and Essington Canal running from Goscote to Pelsall North Common in the Walsall Metropolitan Borough authority area.

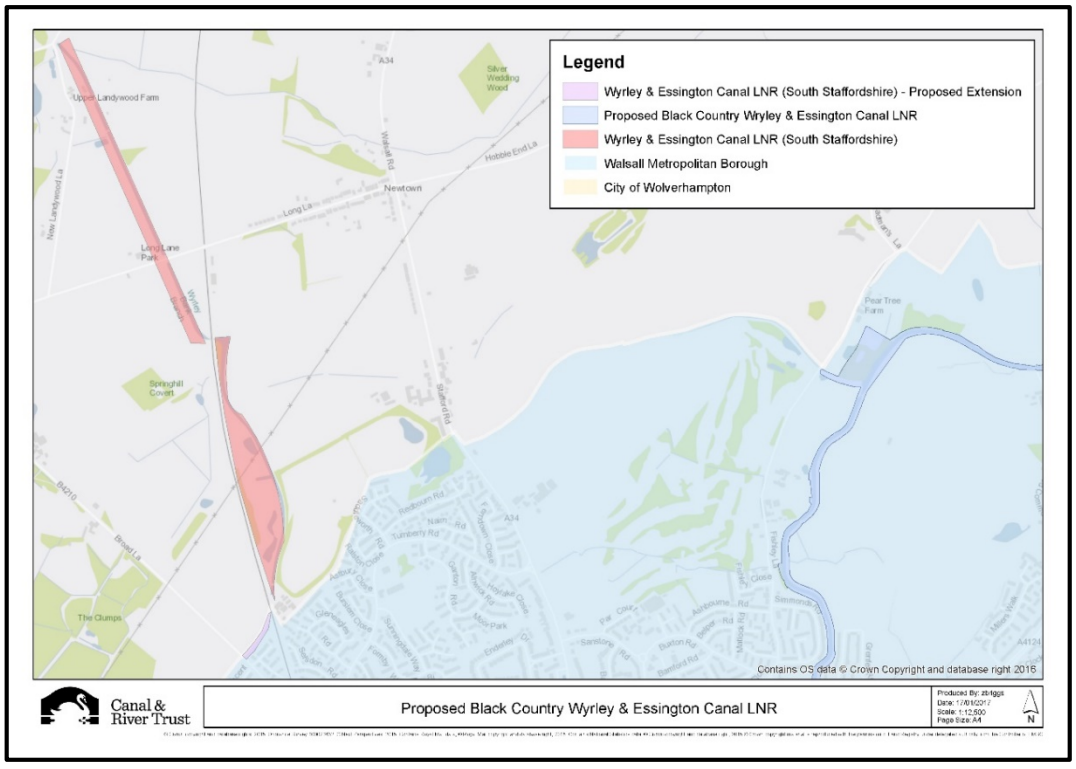

Figure 8.7: Proposed Black Country Wyrley and Essington Canal running from Simmonds Lane to Pelsall North Common in the Walsall Metropolitan Borough authority area.

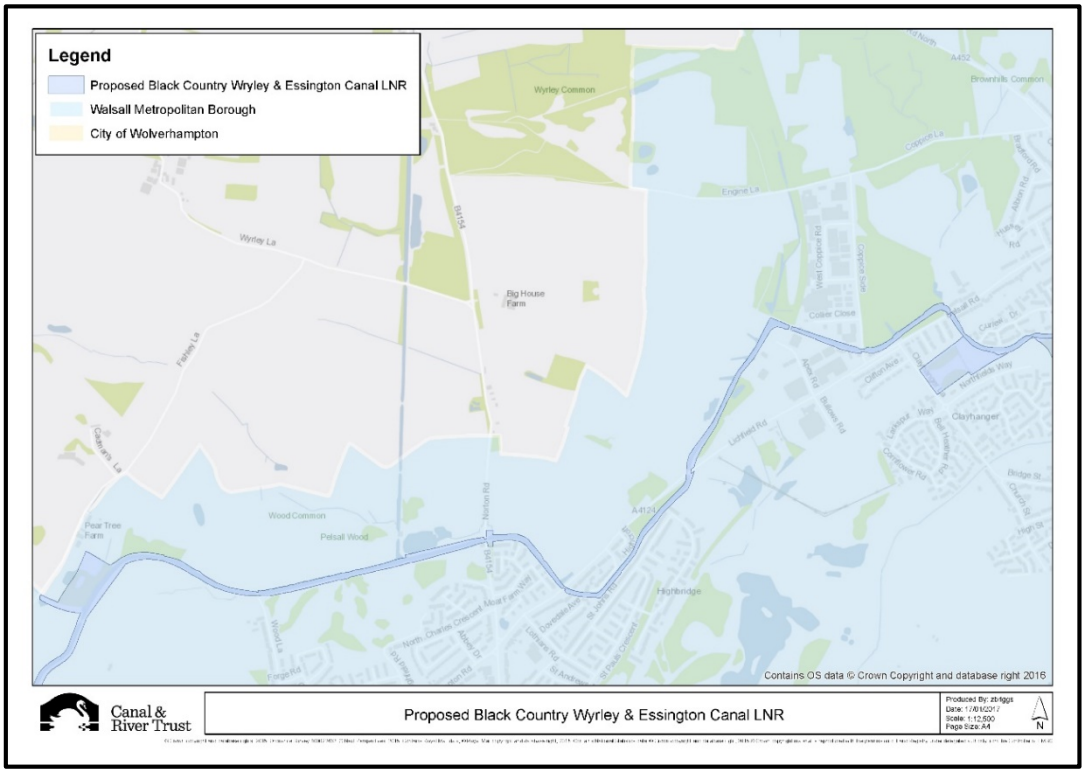

Figure 8.8: Proposed Black Country Wyrley and Essington Canal running from Pelsall North Common to Clayhanger Common in the Walsall Metropolitan Borough authority area.

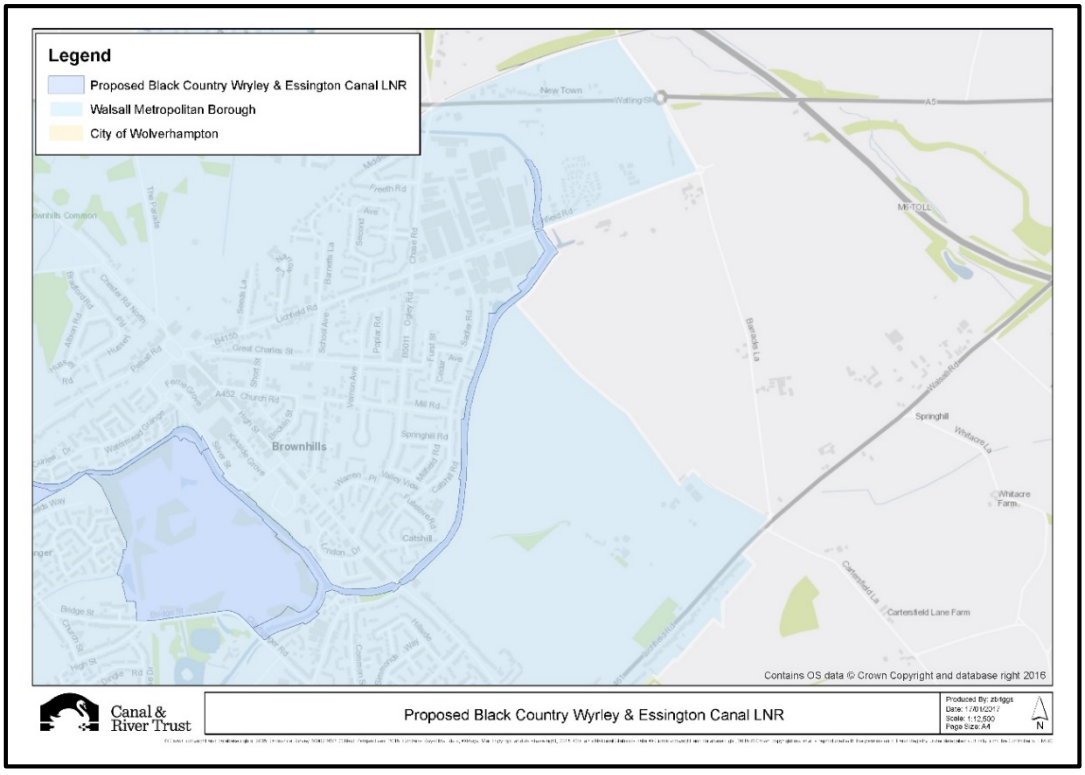

Figure 8.9: Proposed Black Country Wyrley and Essington Canal running from Clayhanger Common to Lichfield Road, Brownhills in the Walsall Metropolitan Borough authority area.

9 Appendix 3 – UK BAP Species within the Black Country Wyrley & Essington LNR

			BAP Species in				
Scientific Name	**Common Name**	**Taxon**	**England**	**Scotland**	**Wales**	**Northern Ireland**	**Original UK BAP species?**
Luronium Natans	Floating Water-Plantain	Vascular Plant	Y	Y	Y	N	Yes – SAP
Arvicola terrestris	Water Vole	Terrestrial Mammal	Y	Y	Y	N	Yes – SAP
Lutra lutra	Otter	Terrestrial Mammal	Y	Y	Y	Y	Yes – SAP
Pipistrelles pyamaeus	Soprano Pipistrelle	Terrestrial Mammal	Y	Y	Y	Y	Yes – SAP
Plecotus auritus	Brown Long-eared Bat	Terrestrial Mammal	Y	Y	Y	Y	
Emberiza citronella	Yellowhammer	Bird	Y	Y	Y	Y	
Poecile montanus	Willow Tit	Bird	Y	Y	Y	N	
Pyrrhula pyrrhula	Common Bullfinch	Bird	Y	Y	Y	Y	Yes – SAP
Carduelis cannabina	Common Linnet	Bird	Y	Y	Y	Y	Yes – SAP
Zootoca Vivipara	Common Lizard	Reptile	Y	Y	Y	Y	
Anguis fragilis	Slow-worm	Reptile	Y	Y	Y	N	
Natrix natrix	Grass Snake	Reptile	Y	Y	Y	N	
Triturus cristatus	Great Crested Newt	Amphibian	Y	Y	Y	N	Yes – SAP
Austropotamobius pallipes	White-clawed Crayfish	Crustacean	Y	Y	Y	Y	Yes - SAP

10 Appendix 4 – Action Plan

Black Country Wyrley & Essington Canal Local Nature Reserve Draft Management Plan

Action Plan

Key to actions: B – Biodiversity; A – Access; I – Information; G – General; L – Locally specific

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
B1 Improve bankside ecology	B1.1 Complete length inspections to identify current bankside vegetation quality and identify most vulnerable regions.	LNR wide	Objective 1	CRT	Low	Short – within 3 months
	B1.2 Generate bankside vegetation maps locating hedgerows, heathland and woodland. Design where and how the areas are going to be managed to improve quantities. Isolate	LNR wide	Objective 1	CRT	Low	Short – 4 months

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	projects into hedgerows, heathland and woodland projects.					
	B1.2.1 Differentiate projects between filling in hedgerow gaps and planting new hedgerows.	LNR wide	Objective 1	CRT	Low	Short – 4 months
	B1.2.2 Identify if current heathland is a native species. If yes, use as a seed source to improve heathland near Pelsall North Common.	Pelsall North Common area, WBC	Objective 1	CRT, WMBC	Low	Short – 4 months
	B1.2.3 Ensure soil is suitable for selected tree types and mixed flowers/shrub layers.	LNR wide	Objective 1	CRT	Low	Short – 4 months
	B1.3 Acquire tools and volunteers to complete projects	LNR wide	Objective 1	CWC, WMBC, CRT	Medium	Short
B2 Improve waterway /	B2.1 Aquatic / semi-aquatic habitat - explore potential	LNR wide	Objective 1	CRT	High	Short / Med / Long

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
margins habitats.	to improve/change maintenance					
B3 Improve existing habitat in canal corridor to create a continuous wildlife corridor where possible	B3.1 Semi-improved grassland, scrub, woodland habitat - explore potential to improve/change maintenance	LNR wide	Objective 1	CWC / WMBC / CRT	High	Short / Med / Long
B4 Change mowing regimes to enhance ecology	B4.1 Use canal bank quality information generated from length inspectors to locate regions of soft bank material.	LNR wide	Objective 1	CRT	Low	Short – 1 month
	B4.2 Reduce mowing frequency in these regions to encourage emergent vegetation to MR2B (as defined within the management plan)	Site specific when maps are completed	Objective 1	CRT	Low	Medium
	B4.3 Aim to introduce MR3A (as defined within the management plan)	Site specific when maps are completed	Objective 1	CRT	Low	Long

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	mowing regime in the future					
B5 Investigate the feasibility of restoring the old arms of the canal	B5.1 Identify ownership of old canal arms at Clayhanger.	Clayhanger	Objective 1	CRT, WMBC	Low	Short – 1 month
	B5.2 Take sediment samples to find quality of the canal arms	Clayhanger	Objective 1	CRT, WMBC	Low	Short – 1 year
	B5.3 Determine whether management is feasible and the most appropriate management technique depending on characteristics, using any water filled arms as a source of *Leronium* (use plants in the Cannock Extension Canal as a seed source).	Clayhanger	Objective 1	CRT, WMBC	Medium	Short – 2 years
B6 Manage trees on the offside by	B6.1 Identify high risk trees through length inspections	LNR wide	Objective 1	CRT	Low	Short – 6 months

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
cutting 2m upwards from the water and 2m away from the water's edge	B6.2 Create a plan to manage high risk trees whilst maintaining some overhang for diversity	LNR wide	Objective 1	CRT, WMBC	High	Short – 6 months
	B6.3 Improve and add emergent vegetation and shrub layers to encourage and protect the newly exposed soil. Gain any access permissions required	LNR wide	Objective 1	CRT, WMBC	High	Short 1.5 years
B7 Remove threat of non-native species	B7.1 Use species surveys to locate regions at risk of invasive species and create event days to target the removal of those species	LNR wide	Objective 1	CRT	Low	Short 1 year
	B7.2 Treat invasive species: Section 1: Himalayan Balsam Sections 4 and 7: Nuttall's Water-weed Section 5: Orange Balsam	LNR Wide	Objective 1	CRT, CWC, WMBC	High	Medium

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	Sections 6 and 7: Japanese Knotweed Section 9 – Floating Pennywort					
	B7.3 Repeat until it is eradicated and monitor the progress. Utilise volunteers from Wolverhampton University to monitor the invasive species	LNR wide	Objective 1	CRT, CWC, WMBC	Medium	Long
A1 Improve towpath condition	A1.1 Survey towpath quality	LNR Wide	Objective 2	CRT	Low	Short
	A1.2 Design a towpath improvement plan, identifying the requirements of each site. Consider the desires of towpath users and environmentally friendly alternatives to hard materials.	LNR wide	Objective 2	CRT	Low	Short

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	A1.3 Secure funding for towpath improvements based on plan	LNR wide	Objective 2	CRT, CWC WMBC	High	Medium
A2 Improve quality of current access points	A2.1 Survey current access points	LNR wide	Objective 2	CRT	Low	Short
	A2.2 Carry out access survey to identify issues. Improve general access and access for disabled and pushchairs at particular locations.	LNR wide	Objective 2	CWC / WMBC / CRT	High	Short / Medium / Long
	A2.3 Identify any improvements required and make a plan regarding the requirements.	LNR wide	Objective 2	CRT	Low	Medium
	A2.4 Secure funding and resources	LNR wide	Objective 2	CRT	High	Medium
A3 Improve existing 'honeypot' sites	A3.1 Locate and survey the current sites	LNR wide	Objective 2	CWC, WMBC, CRT	Low	Short

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	A3.2 Identify any issues and plan how to tackle the improvements.	LNR wide	Objective 2	CWC, WMBC, CRT	Low	Short
	A3.3 Secure funding and any permissions	LNR wide	Objective 2	CWC, WMBC, CRT	High	Medium
A4 Manage visitor impacts by appropriate zoning	A4.1 Locate areas that would benefit from isolation	LNR wide	Objective 1	CRT	Low	Short
	A4.2 Design methods to protect desired locations	LNR wide	Objective 1	CRT	Low	Short
	A4.3 Secure funding and land permissions	LNR wide	Objective 1	CRT	High	Medium
I1 Ensure information is presented in a suitable format on signage around the canal.	I1.1 Identify which services and facilities are present along the canal that can be mentioned on signage.	LNR Wide	Objective 3	CWC / WMBC / CRT	Low	Short
	I1.2 Required: LNR signs at key points; Potential: local historic interest; local nature conservation interest; Promotion to employers / workers / visitors eg at	LNR wide	Objective 3	CWC / WMBC / CRT	High	Short

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	industrial estates, New Cross Hospital, Bentley Bridge Retail Park, Wednesfield Leisure Centre, Wednesfield Village Centre, etc.					
	I1.3 Map suitable locations along the canal for signage.	LNR wide	Objective 3	CWC / WMBC / CRT	Low	Short
	I1.4 Decide the style of signs and design of map and information	LNR wide	Objective 3	CWC / WMBC / CRT	Medium	Medium
	I1.5 Secure funding and contracts with those to implement signs	LNR wide	Objective 3	CWC / WMBC / CRT	High	Medium
Promotion in local community	I1.6 Local residents: Schools, walking groups, friends of the LNR group, etc. Workers / visitors: industrial estates, New Cross Hospital, Bentley Bridge Retail Park,	LNR wide	Objective 3	CRT	Low	Short / Medium / Long

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	Wednesfield Leisure Centre, etc.					
Encouraging more water traffic	I1.7 Activity to increase use by narrowboats, canoeists, etc. Better facilities e.g. moorings, waterpoints; promotion; events	LNR wide	Objective 3	CWC / WMBC / CRT	High	Short / Medium / Long
Encouraging walker and cyclist interaction	I1.8 Creation of walking and cycle routes within the LNR that benefit health and recreation	LNR wide	Objective 3	CWC / WMBC	Medium	Short / Medium / Long
Interpretation – Website / App	I1.9 Required: Information on CRT website with links to WCC/WMBC websites; QR Codes; leaflets Potential = Part of CRT or other leisure-based app's	LNR wide	Objective 3	CWC/ WMBC / CRT	Low	Short
G1 Develop spend profile for developer contributions	G1.1 Use contributions as match-funding for external funding bids	LNR wide	Objectives 1, 2 & 3	CWC/ WMBC / CRT	High	Short
	G1.2 Select priority projects for spend	LNR wide	Objectives 1, 2 & 3	CWC/ WMBC / CRT	High	Medium

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
allocated to the LNR						
G2 Stakeholder analysis	G2.1 Produce stakeholder analysis and communications plan	LNR wide	Objectives 1, 2 & 3	CRT, CWC, WMBC	Medium	Short
G3 Inclusion in wider initiatives	G3.1 Incorporate into projects focusing on wider initiatives aimed at promoting green space sites & improving access to them (e.g. Green pathways/ Urban Park proposal)	LNR wide	Objectives 2 & 3	CWC/ CRT/ WMBC/Wildlife Trust	High	Medium/ Long
G4 Funding Sources	G4.1 Actively identify and pursue additional sources of external funding	LNR Wide	Objectives 1, 2 & 3	CRT, CWC, WMBC	Low	Short
	G4.2 Prepare and submit a NIA funding proposal	LNR Wide	Objectives 1, 2 & 3	CRT, CWC, WMBC	Low	Short
L1 Wolverhampton Walkover Survey Actions	L1.1 Agree, prioritise and action immediate 'Quick Wins' (as detailed in appendix 3 of the management plan) enhancements identified	CWC	Objectives 1, 2 & 3	CWC, CRT	Medium	Short

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	during walk-over surveys conducted in 2015					
L2 City of Wolverhampton land adjoining canal **(priority actions)**	L2.1 Japanese knotweed treatment	Site 2 – Heath Town	Objective 1	CWC	High	Short
	L2.2 Establish woodland field layer; tree management; signage	Site 7 – Wednesfield Park	Objective 1	CWC	High	Short/Medium
	L2.3 Hedge management; Tree planting (potentially fruit trees)	Site 8	Objective 1	CWC, CRT	Medium	Short
	L2.4 Retain woodland strip and create habitat / remodel landscaping	Site 10	Objective 1	CWC	High	Short
	L2.5 Retain scrub strip; create scrub / woodland habitat alongside pylon corridor to soften fenced edges, & create wildlife corridor and promote use of LNR (signage)	Site 11	Objectives 1 & 2	CWC	High	Short/Medium
	L2.6 Fenced woodland strip with some garden	Site 13	Objective 2	CWC	Medium	Short

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	encroachment – work with Wolverhampton Homes to retain or remove fence					
	L2.7 Former canal weir/pond – establish CRT ownership and potential to clear land of rubbish/open up	Site 15	Objectives 1 & 3	CWC, CRT	Medium	Short/Medium
	L2.8 Look at potential for: signage; Reinstatement of habitat corridor; Access improvements; Moorings / boaters' facilities inc water point	Site 6 - Bentley Bridge Canal Corridor	Objectives 1, 2 & 3	CWC, CRT	High	Short/Medium
	L2.9 Towpath improvements to facilitate cycling/walking (Black country SEP growth fund short trips project - New Cross Hospital access)	Wolverhampton City Centre to New Cross Hospital	Objective 3	CRT / CWC	High	Short 2017 (business case has been submitted)
	L2.10 Canalside / towpath improvements associated	CWC	Objectives 2 & 3	CRT / CWC / Developers	High	Long

Ref. Name of Action / Project	Description of Action / Project	Location	Contribution towards Management Plan Objectives	Partners Involved	Cost Estimate: Low (£100-£5000) Medium (£5001-£15000) High (>£15001)	Timescale: Short (1-2 yr) Medium (3-5 yr) Long (> 5 yr)
	with development opportunities	Qualcast Road Development Sites				
	L2.11 Various landscaping works alongside canal/towpath as part of large housing development on former Jennie Lee site	Former Jennie Lee Centre	Objectives 1, 2 & 3	CWC	Low (developer costs)	Short
L3 Walsall MBC land adjoining canal	L3.1 Reinstate towpath/foot access on north side of canal (east of Bentley Wharf Bridge) up to M6 motorway bridge/the Piggeries	WMBC Towpath reinstatement between Bentley Wharf bridge and the Piggeries	Objectives 2 & 3	CRT/WMBC/ Developers	High	Long
	L3.2 Install motorcycle barriers along towpath to protect Great Crested Newt habitat in Rough Wood Chase	WMBC GCN Habitat Protection – Rough Chase Woods	Objectives 1 & 3	CRT/WMBC/Developers	Medium	Long

11 Appendix 5 – Potential Short Term Enhancements within the Wolverhampton LNR Boundary

Walkover surveys along the length of the proposed Black Country Wyrley and Essington Canal LNR have identified a number of 'quick win' enhancements within Wolverhampton. These enhancements have been categorised into one of four groups: Towpath; Wall or fence improvements; Bank Protection; Waste and Pollution; and Greening. The table below details the Proposed feature for enhancement and its location along the canal.

Enhance Feature	Location	Details
GREENING		
Bare Wall	Horseley Field Junction to Swan Garden Bridge	Possible area for green planting or introducing street art.
Bridge	Swan Garden Bridge	Could benefit from greening and bright planting.
Bare Wall	Sections of bare wall close to Inkerman Grove	Possible enhancements include green planting or the introduction of street art.
Waste Ground	An area of waste ground, adjacent to Alma Street Industrial Estate	The easiest option would to introduce plants either into the substrate or by using planters. A further option to consider is clearing the site and installing local artworks. Would need to establish ownership.
Metal Fencing	Between Heath Town Railway Bridge and Deans Road Bridge	Introducing shrubs into this area could improve ecological value by offering additional habitat and connectivity and would help to screen the fence.
Bridge	Deans Road Bridge	Could benefit from greening and bright planting.
Arch	Between Deans Road Bridge and Heath Town Bridge	An arch extends across the canal between Deans Road Bridge and Heath Town Bridge. The offside parapet to which the arch is connected to an interesting structure that offers a great deal of scope for improvement. Using planters could add some colour and introducing trailing plants such as Ivy could green the vertical surfaces.
Bridge	Heath Town Bridge	Could benefit from greening and bright planting.
Bridge	New Bentley Bridge	Could benefit from greening and bright planting.

Planted Beds	Adjacent to Nickelodeon	Large parts of the beds remain as bare earth and more could be made of this area. Introducing more plants would have a positive effect.
Planted Beds	Adjacent to Bentley Bridge Retail Park	Planting within the beds appears fairly sparse and a significant proportion remains as bare earth. Introducing more plants would have a positive effect.
Bridge	Rookery Bridge	Could benefit from greening and bright planting.
Bare Wall	Rookery Bridge to Church Bridge	Possible enhancements include green planting or the introduction of street art.
Bare Wall	Church Bridge to Pinfold Bridge	The bare concrete wall along the towpath could be screened out using shrubs or vertically growing vegetation.
Bare Ground	East of Pinfold Bridge	Green planting here would improve aesthetics and could be used to enhance the ecology.
Tree Encroachment	125 m from Pinfold Bridge on Northward Bend	Trees should be thinned to create a more open area.
Bridge	Devils Elbow Bridge	Planting here could improve the aesthetics of what is already an attractive structure.
Tree Encroachment	West of Olinthus Bridge	Offside tree encroachment in particular a large willow is causing excessive shading. Trees should be thinned to create a more open area.
Bridge & Access	Olinthus Bridge and access point	Green planting could be used to improve the stark nature of the surroundings in this area particularly as this is an access point with significant footfall. The waste bin on the canalside is something of an eyesore.
Metal Fencing	Between Olinthus Bridge and Perry Hall Bridge	The aesthetics of this area would benefit from the planting of shrubs or trees to screen out the harsh metal fencing. Vegetation along the fence had been subject to herbicide spraying.
Bridge & Access	Perry Hall Bridge and access point	Green planting could be used to improve the stark nature of the surroundings in this area. The bridge structure itself is covered with graffiti and would be a good candidate for the adoption of some form of urban street art.

TOWPATH, WALL & FENCING		
Towpath	Horseley Fields Junction to Heathtown Railway Bridge	Quality of the towpath is poor in places and in need of repair.
Boundary Fencing	Swan Garden Bridge	Options include reinstating the fence or removing entirely to offer open access to the canal.
Damaged Wall	Adjacent to Alma Street Industrial Estate	Broken wall providing unofficial access to the canal.
Collapsed Structure	Between Rookery Bridge and Church Bridge	Possible enhancements include green planting or the introduction of street art.
Unofficial Access	75 m North of Wards Bridge	Options are to prevent access by, for example, fencing the area, upgrade the area to an official access point or take no action. Some assessment of footfall is required.
Access Point	125 m Northeast of Moat House Bridge	Excessive vegetation on access route. Management required to open up the access route.
Broken Fencing	West of Olinthus Bridge	Fencing is broken allowing access. Fence should be reinstated or removed.
Damaged Wall	Olinthus Bridge	The wall and capping on the steps down to the tow path from the road above require repair.
Unofficial Access	West of Perry Hall Bridge	Options are to prevent access by, for example, fencing the area, upgrade the area to an official access point or take no action. Some assessment of footfall is required.
BANK PROTECTION		
Coir Installation	Adjacent to Alma Street Industrial Estate	A gap in the offside bank protection. Coir roll could be used to encourage aquatic plants offering protection to the bank and improving connectivity.
Coir Installation	Between Swan Garden Bridge and Heathtown Railway Bridge	Lengthy sections of bare wall on offside. Coir roll or Gabion baskets could be used to encourage aquatic plants offering protection to the bank, screening out the stark walls and improving connectivity.
Wall Repair	Bank Wall adjacent to Perch Close	The bankside wall adjacent to Perch Close requires repair. A section of brick wall has begun to collapse into the waterway.
Coir Installation	Rookery Bridge	Lengthy sections of bare wall. Coir roll or Gabion baskets could be used to encourage aquatic plants

		offering protection to the bank, screening out the stark walls and improving connectivity.
Coir Installation	Church Bridge to Pinfold Bridge	Coir roll or Gabion baskets could be used to encourage aquatic plants offering protection to the bank, screening out the stark walls and improving connectivity.
Coir Installation	Wards Bridge	Hard brick banking on nearside at Wards Bridge. Coir rolls installed here could benefit connectivity, provide addition habitat and improve aesthetics.
Coir Installation	Northeast of Moat House Bridge	Hard Brick Banking could be enhanced by the installation of coir roll to provide vegetated soft banking
WASTE & POLLUTION		
Fly tipping	Swan Garden Bridge	Offside fly-tipping close to Swan Garden Bridge.
Litter (In-Channel)	Heath Town Bridge to New Bentley Bridge	The channel contains a significant amount of litter which will need to be removed.
Fly tipping	Bentley Bridge Retail Park	Bankside Flying Tipping and litter within the channel should be removed
Litter (In-Channel)	Rookery Bridge	A significant amount of litter has accumulated in the channel below the bridge. This should be removed.
Giant Hogweed	75 m east of Pinfold Bridge	Stand of Giant Hogweed on offside. Should be adequately removed and disposed of.
Japanese Knotweed	100 m east of Pinfold Bridge	Stand of Japanese knotweed on offside. Should be adequately removed and disposed of.
Pollution	100 m east of Pinfold Bridge	Pollution run-off 100 metres east of Pinfold bridge on the offside. Source to be idenitified and dealt with.
Pollution	South of Wards Bridge	Oil pollution present on the surface of the water column.

12 Appendix 6 – The value of different tree and shrub species to wildlife

The value of trees will depend on whether they are of open-grown form or close-grown within groups. The former is far more valuable for wildlife in general. A tree standing alone is usually able to realise its full potential in terms of leaf area and flowering. Scattered trees have also been recognised as keystone structures for wildlife and cultural landscapes.

Table 1, below, details the quality and quantity of species assemblages associated with the widespread trees and shrubs of the British countryside. The value to wildlife is graded on a scale between 1 and 5. 1 indicates an estimated low value to wildlife, while 5 indicates a relatively high value. The trees and shrubs are listed in taxonomic order to facilitate comparison of close species. Most tree species are ectomycorrhizal; the exceptions are indicated with a G (glomalean endomycorrhizal).

Tree Type	Mycorrihizal fungi	Wood-decay fungi	Wood-decay Inverts	Foliage Inverts	Biomass of foliage inverts	Leaf Litter	Blossom for pollen and nectar	Fruits and Seeds	Epiphyte communities
Pinaceae									
Norway Spruce	5	2	3	3	3	1	1	4	1
European Larch	5	2	1	2	3	1	1	4	1
Scots Pine	5	3	4	4	4	1	1	4	1
Taxaceae									
Yew	3G	2	1	1	2	1	1	4	1
Platanaceae									
London Plane	3G	2				1			1
Ulmaceae									
Elms	3G	4	3	3	3	4	1	1	5
Juglandaceae									
Walnut	3G	2				3			1
Fagaceae									
Beech	5	5	5	3	1	1	1	5	5
Sweet Chestnut	3	3	3	1	1	1	1	5	1
Turkey Oak	1	3	4			3			1
Holm Oak	3	3	1	1	1	1	1	5	1
Native Oaks	5	5	5	5	5	3	1	5	5
Betulaceae									
Birches	5	4	4	5	4	3	1	4	4

Alder	3	3	2	1	4	3	1	4	2
Hazel	2	3	3	3	3	4	1	3	4
Hornbeam	3	2	2	2	1	3	1	3	2
Tiliaceae									
Limes	4	3	2	2	3	4	4	1	2
Salicaceae									
Poplars	3	3	3	4	3	3	1	1	1
Goat/Grey Willow	3	3	3	5	3	3	5	1	4
Crack, White and other rough-barked Willows	4	3	3	4	3	3	5	1	1
Rosaceae									
Cherries	3G	2	1	3	2	4	4	5	1
Plum	3G	2	3	3	3	4	4	4	1
Pear	3G	2	3	4	3	4	4	3	3
Apple	3G	2	3	4	3	4	4	4	3
Rowan and Whitebeams	3G	2	1	1	1	4	4	4	3
Hawthorns	3G	2	3	4	3	5	5	4	1
Fabaceae									
False-acacia	3G	2	3	1	1	3	4	1	1
Aquifoliaceae									
Holly	3G	1	1	1	2	1	5	4	2
Hippcastanaceae									
Horse-chestnut	3G	2	3	1	1	2	4	1	1
Aceraceae									
Field Maple	3G	2	2	2	1	3	4	1	3
Sycamore	3G	3	3	2	5	5	4	1	5
Oleaceae									
Ash	3G	3	5	3	1	5	1	1	5

Table 1: The quality and quantity of species assemblages associated with the widespread trees and shrubs of the British countryside (Alexander et al., 2006)

A wider range of associates may be expected where the tree is within its native range. Equally, the representation of associates will vary across that range, as each associate will have its own range and mobility. Representation of associated species may be greater in the centre of the range, lower at the edge, and very restricted when the tree has been planted beyond its native range.

Host tree abundance has probably the greatest influence on total invertebrate species richness. That said other variables have a role to play in the overall invertebrate species richness. Such variables include the number of years a tree species has been present and whether or not it is evergreen or coniferous. Studies have found that taxonomic relatedness, leaf size and tree height all contribute significantly.

Table 2, below, details the number of species of phytophagous insects and mites associated with tree species within the UK.

Trees Species	**No of Associated Invertebrate Species**
Salix (5 spp.)	450
Quercus (2 spp.)	423
*Betula (*2 spp.)	334
Crataegus monogyna	209
Populus (4 spp.)	189
Pinus sylvestris	172
Prunus spinose	153
Alnus glutinosa	141
Ulmus (2 spp.)	124
Malus sylvestris	118
Corylus avellana	106
Fagus sylvatica	98
Picea abies	70
Fraxinus excelsior	68
Sorbus aucuparia	58
Tilia (2 spp.)	57
Acer campestre	51
Carpinus betulus	51
Acer pseudoplatanus	43
Larix decidua	38

Juniperus communis	32
Castanea sativa	11
Ilex aquifollum	10
Aesculus hippocastanum	9
Juglans regia	7
Taxus baccata	6
Quercus ilex	5
Robinia pseudoacacia	2

Table 2: Number of species of phytophagous insects and mites associated with trees in Britain (Kennedy & Southwood, 1984)

References

ALEXANDER, K., BULTER, J. and GREEN, T., 2006. The value of different tree and shrub species to wildlife. *British Wildlife,* (October 2006), pp. 18-28.

KENNEDY, C.E.J. and SOUTHWOOD, T.R.E., 1984. The Number of Species of Insects Associated with British Trees: A Re-analysis. *Journal of Animal Ecology,* **53**, pp. 455-478.

13 Appendix 7 – Wyrley & Essington Ecological Survey: City of Wolverhampton Council

A full ecological survey was carried out by ecologists during September 2013. The tables below detail the recorded botanical and animal biodiversity recorded along the length of the Wyrley & Essington canal within the City of Wolverhampton Council area.

Flora

WV020:1 Horseley Fields Junction – Railway Bridge (17th September 2011)	
Scientific Name	**Common Name**
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alopecurus pratensis	Meadow Foxtail
Anthriscus sylvestris	Cow Parsley
Armoracia rusticana	Horse-radish
Arrhenatherum elatius	False Oat-grass
Artemisia absinthium	Wormwood
Artemisia vulgaris	Mugwort
Aster sp.	a michaelmas-daisy
Bellis perennis	Daisy
Berula erecta	Lesser Water-parsnip
Betula pendula	Silver Birch
Bromus hordeaceus ssp. hordeaceus	a soft-brome
Bryonia dioica	White Bryony
Buddleja davidii	Butterfly-bush
Calystegia silvatica	Large Bindweed
Carex otrubae	False Fox-sedge
Cerastium fontanum	Common Mouse-ear
Ceratophyllum demersum	Rigid Hornwort
Chamerion angustifolium	Rosebay Willowherb
Cirsium arvense	Creeping Thistle
Conyza canadensis	Canadian Fleabane
Cotoneaster sp.	a cotoneaster
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth Hawk's-beard
Cynosurus cristatus	Crested Dog's-tail
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Daucus carota ssp. carota	Wild Carrot
Dryopteris filix-mas agg.	Male Fern
Elodea nuttallii	Nuttall's Water-weed
Epilobium hirsutum	Great Willowherb
Equisetum arvense	Field Horsetail
Fallopia japonica	Japanese Knotweed
Fraxinus excelsior	Ash
Galium aparine	Cleavers
Geranium molle	Dove's-foot Crane's-bill
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hippuris vulgaris	Mare's-tail
Holcus lanatus	Yorkshire-fog
Hordeum murinum	Wall Barley
Iris pseudacorus	Yellow Iris
Juncus articulatus	Jointed Rush
Lactuca serriola	Prickly Lettuce
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Linaria vulgaris	Common Toadflax

Lolium perenne	Perennial Rye-grass
Lotus corniculatus	Common Bird's-foot-trefoil
Lycopus europaeus	Gipsywort
Malva sylvestris	Common Mallow
Mentha aquatica	Water Mint
Myriophyllum spicatum	Spiked Water-milfoil
Nymphaea alba	White Water-lily
Persicaria amphibia	Amphibious Bistort
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Poa pratensis sens.lat.	Smooth Meadow-grass
Potamogeton natans	Broad-leaved Pondweed
Prunus laurocerasus	Cherry Laurel
Pteridium aquilinum	Bracken
Ranunculus circinatus	Fan-leaved Water-crowfoot
Ranunculus repens	Creeping Buttercup
Riccia fluitans	a liverwort
Rubus fruticosus agg.	Bramble
Rumex crispus	Curled Dock
Rumex hydrolapathum	Water Dock
Rumex obtusifolius	Broad-leaved Dock
Sagittaria sagittifolia	Arrowhead
Salix caprea	Goat Willow
Salix cinerea	Grey Willow
Salix x sepulcralis nothovar. chrysocoma	Weeping Willow
Sambucus nigra	Elder
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Senecio squalidus	Oxford Ragwort
Silene vulgaris	Bladder Campion
Sisymbrium orientale	Eastern Rocket
Sonchus oleraceus	Smooth Sow-thistle
Sorbus aria agg.	Whitebeam
Sorbus aucuparia	Rowan
Sparganium erectum	Branched Bur-reed
Tanacetum vulgare	Tansy
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle
Vicia sepium	Bush Vetch

WV020:2 Railway Bridge – Dean's Road Bridge (17th September 2011)	
Scientific Name	**Common Name**
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alisma plantago-aquatica	Water-plantain
Alnus glutinosa	Alder
Anthriscus sylvestris	Cow Parsley
Arrhenatherum elatius	False Oat-grass
Artemisia absinthium	Wormwood
Artemisia vulgaris	Mugwort

Berula erecta	Lesser Water-parsnip
Betula sp.	a birch
Buddleja davidii	Butterfly-bush
Butomus umbellatus	Flowering Rush
Calystegia silvatica	Large Bindweed
Chamerion angustifolium	Rosebay Willowherb
Cirsium arvense	Creeping Thistle
Cirsium palustre	Marsh Thistle
Cirsium vulgare	Spear Thistle
Clematis vitalba	Traveller's Joy
Cotoneaster sp.	a cotoneaster
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth Hawk's-beard
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Dryopteris filix-mas agg.	Male Fern
Elodea nuttallii	Nuttall's Water-weed
Epilobium hirsutum	Great Willowherb
Epilobium parviflorum	Hoary Willowherb
Fallopia japonica	Japanese Knotweed
Festuca rubra agg.	Red Fescue
Glyceria maxima	Reed Sweet-grass
Heracleum sphondylium	Hogweed
Hippuris vulgaris	Mare's-tail
Holcus mollis	Creeping Soft-grass
Lactuca serriola	Prickly Lettuce
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Linaria vulgaris	Common Toadflax
Lolium perenne	Perennial Rye-grass
Lycopus europaeus	Gipsywort
Medicago lupulina	Black Medick
Myriophyllum spicatum	Spiked Water-milfoil
Nymphaea alba	White Water-lily
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Potamogeton natans	Broad-leaved Pondweed
Ranunculus circinatus	Fan-leaved Water-crowfoot
Ranunculus repens	Creeping Buttercup
Riccia fluitans	a liverwort
Rosa arvensis	Field Rose
Rubus fruticosus agg.	Bramble
Rumex obtusifolius	Broad-leaved Dock
Salix caprea	Goat Willow
Salix cinerea	Grey Willow
Salix sp.	a sallow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Senecio jacobaea	Common Ragwort
Sonchus asper	Prickly Sow-thistle
Sparganium erectum	Branched Bur-reed
Tanacetum vulgare	Tansy
Taraxacum officinale agg.	Dandelion
Trifolium pratense	Red Clover
Trifolium repens	White Clover

Tussilago farfara	Colt's-foot
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle

Birds (17th September 2011)

Scientific Name	Common Name
Anas platyrhynchos	Mallard
Cygnus olor	Mute Swan
Fulica atra	Coot
Gallinula chloropus	Moorhen

Fish (17th September 2011)

Scientific Name	Common Name
Abramis brama	Bream
Cyprinus carpio	Carp
Tinca tinca	Tench

Invertebrates (17th September 2011)

Scientific Name	Common Name
Aglais urticae	Small Tortoiseshell
Anodonta cygnea	Swan Mussel
Apidae sp.	a bee
Coccinella septempunctata	Seven-spot Ladybird
Tyria jacobaeae	Cinnabar
Zygoptera sp.	a damselfly

Species Records: Wyrley and Essington Canal - 16th Septemeber 2013

WV020:3 Deans Road Bridge - Heath Town Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Aegopodium podagraria	Ground-elder
Agrostis stolonifera	Creeping Bent
Alisma lanceolata	Narrow-leaved Water-plantain
Alliaria petiolata	Garlic Mustard
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Armoracia rusticana	Horseradish
Arrhenatherum elatius	False Oat-grass
Artemisia absinthium	Wormwood
Artemisia vulgaris	Mugwort
Asplenium ruta-muraria	Wall-rue
Asplenium scolopendrium	Hart's-tongue
Asplenium trichomanes	Maidenhair Spleenwort
Betula pendula	Silver Birch
Buddleja davidii	Butterfly-bush
Butomus umbellatus	Flowering Rush
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's-purse
Cardamine hirsuta	Hairy Bitter-cress
Carex otrubae	False Fox-sedge
Centaurea nigra	Common Knapweed
Cerastium fontanum	Common Mouse-ear
Circium arvense	Creeping Thistle
Cotoneaster sp.	A Cotoneaster
Dactylis glomerata	Cock's-foot
Dryopteris filix-mas	Male-fern
Epilobium hirsutum	Great Willowherb
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Glyceria maxima	Reed Sweet-grass
Lamium album	White Dead-nettle
Leontodon autumnalis	Autumnal Hawkbit
Lotus corniculatus	Common Bird's-foot Trefoil
Lycopus europaeus	Gipsywort
Nuphar lutea	Yellow Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Persicaria amphibia	Amphibious Bistort
Pilosella officinarum	Mouse-ear Hawkweed
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Rumex hydrolapathum	Water Dock
Sagina procumbens	Procumbent Pearlwort
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Senecio vulgaris	Groundsel
Sonchus arvensis	Perennial Sow-thistle
Sparganium emersum	Unbranched Bur-reed
Taraxacum officinale agg.	Dandelion
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle

Verbascum thapsus	Great Mullein
Vulpia myuros	Rat's-tail Fescue

WV020:4 Heath Town Bridge - New Cross Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Agrostis stolonifera	Creeping Bent
Alnus cordata	Italian Alder
Alnus glutinosa	Alder
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Bidens frondosa	Beggarticks
Buddleja davidii	Butterfly-bush
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's-purse
Carex otrubae	False Fox-sedge
Carex rostrata	Bottle Sedge
Castanea sativa	Hornbeam
Cerastium fontanum	Common Mouse-ear
Cerastium tomentosum	Snow-in-summer
Convolvulus arvensis	Field Bindweed
Crataegus monogyna	Hawthorn
Dactylis glomerata	Cock's-foot
Epilobium hirsutum	Great Willowherb
Epilobium parviflorum	Hoary Willow-herb
Equisetum arvense	Field Horsetail
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Geranium pusillum	Small-flowered Crane's-bill
Glyceria maxima	Reed Sweet-grass
Hieracium sp	a Hawkweed
Hippuris vulgaris	Mare's-tail
Humulus lupulus	Hop
Iris pseudacorus	Yellow Iris
Lamium album	White Dead-nettle
Leontodon autumnalis	Autumnal Hawkbit
Ligustrum ovalifolium	Garden Privet
Lolium perenne	Perennial Rye-grass
Lycopus europaeus	Gipsywort
Matricaria discoidea	Pineappleweed
Medicago lupulina	Black Medick
Mentha aquatica	Water Mint
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Persicaria amphibia	Amphibious Bistort
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Potentilla reptans	Creeping Cinquefoil
Quercus robur	Pedunculate Oak
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Rumex obtusifolius	Broad-leaved Dock
Sagina procumbens	Procumbent Pearlwort
Salix caprea	Goat Willow

Salix fragilis	Crack Willow
Sambucus nigra	Elder
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Senecio vulgaris	Groundsel
Sonchus oleraceus	Smooth Sow-thistle
Sorbus intermedia	Swedish Whitebeam
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Taraxacum officinale agg.	Dandelion
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle
Vicia cracca	Tufted Vetch
Vicia sepium	Bush Vetch

WV020:5 New Cross Bridge - Rookery Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Aethusa cynapium	Fool's Parsley
Agrostis stolonifera	Creeping Bent
Alnus glutinosa	Alder
Alnus incana	Grey Alder
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Asplenium ruta-muraria	Wall-rue
Betula pendula	Silver Birch
Buddleja davidii	Butterfly-bush
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's-purse
Carex otrubae	False Fox-sedge
Castanea sativa	Hornbeam
Cerastium fontanum	Common Mouse-ear
Circium vulgaris	Spear Thistle
Conyza canadensis	Canadian Fleabane
Cornus sanguinea	Dogwood
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Dactylis glomerata	Cock's-foot
Epilobium hirsutum	Great Willowherb
Epilobium roseum	Pale Willowherb
Equisetum arvense	Field Horsetail
Euphorbia peplus	Petty Spurge
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hieracium sp	a Hawkweed
Hippuris vulgaris	Mare's-tail
Hordeum murinum	Wall Barley
Iris pseudacorus	Yellow Iris
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed

Leontodon autumnalis	Autumnal Hawkbit
Lolium perenne	Perennial Rye-grass
Lycopus europaeus	Gipsywort
Lythrum salicaria	Purple Loosetrife
Matricaria discoidea	Pineappleweed
Mentha aquatica	Water Mint
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygonum aviculare agg.	Knot-grass
Potentilla reptans	Creeping Cinquefoil
Prunus avium	Wild Cherry
Quercus robur	Pedunculate Oak
Ranunculus acris	Meadow Buttercup
Ranunculus repens	Creeping Buttercup
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Salix caprea	Goat Willow
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Senecio squalidus	Oxford Ragwort
Sisymbrium officinalis	Hedge Mustard
Sonchus asper	Prickly Sow-thistle
Sonchus oleraceus	Smooth Sow-thistle
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stellaria media	Common Chickweed
Taraxacum officinale agg.	Dandelion
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle
Veronica chamaedrys	Germander Speedwell
Vicia sativa ssp. segetalis	Common Vetch

WV020:6 Rookery Bridge - Church Bridge (16th September 2013)	
Scientific name	**Common name**
Acer platanoides	Norway Maple
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Anthriscus sylvestris	Cow Parsley
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Berula erecta	Lesser Water-parsnip
Buddleja davidii	Butterfly-bush
Calystegia sepium	Hedge Bindweed
Calystegia silvatica	Large Bindweed
Cerastium fontanum	Common Mouse-ear
Chamerion angustifolium	Rosebay Willowherb
Conyza canadensis	Canadian Fleabane
Cornus sanguinea	Dogwood
Cotoneaster salicifolia	Willow-leaved Cotoneaster
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth Hawk's-beard

Dactylis glomerata	Cock's-foot
Dryopteris filix-mas	Male-fern
Epilobium hirsutum	Great Willowherb
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Geranium robertianum	Herb-robert
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hippuris vulgaris	Mare's-tail
Hippuris vulgaris	Mare's-tail
Hordeum murinum	Wall Barley
Iris pseudacorus	Yellow Iris
Lamium album	White Dead-nettle
Lapsana communis	Nipplewort
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumnal Hawkbit
Lolium perenne	Perennial Rye-grass
Lycopus europaeus	Gipsywort
Medicago lupulina	Black Medick
Mentha aquatica	Water Mint
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygonum aviculare agg.	Knot-grass
Populus x canadensis	Hybrid Black Poplar
Prunus avium	Wild Cherry
Pteridium aquilinum	Bracken
Ranunculus repens	Creeping Buttercup
Rosa canina agg.	Dog Rose
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Salix fragilis	Crack Willow
Sambucus nigra	Elder
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Sisymbrium officinalis	Hedge Mustard
Sonchus oleraceus	Smooth Sow-thistle
Sorbus aria agg.	Whitebeam
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stellaria media	Common Chickweed
Symphoricarpos albus	Snowberry
Symphytum x uplandicum	Russian Comfrey
Syringa vulgaris	Lilac
Taraxacum officinale agg.	Dandelion
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Urtica dioica	Common Nettle

WV020:7 Church Bridge - Pinfold Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Aethusa cynapium	Fool's Parsley

Agrostis stolonifera	Creeping Bent
Arctium minus	Lesser Burdock
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Atriplex patula	Common Orache
Bellis perennis	Daisy
Calystegia silvatica	Large Bindweed
Castanea sativa	Sweet Chestnut
Cerastium fontanum	Common Mouse-ear
Chamerion angustifolium	Rosebay Willowherb
Circium arvense	Creeping Thistle
Circium vulgare	Spear Thistle
Conyza canadensis	Canadian Fleabane
Cotoneaster x watereri	Waterer's Cotoneaster
Crataegus monogyna	Hawthorn
Dactylis glomerata	Cock's-foot
Dryopteris filix-mas	Male-fern
Epilobium hirsutum	Great Willowherb
Festuca rubra agg.	Red Fescue
Geranium robertianum	Herb-robert
Geum urbanum	Herb Bennet
Glyceria maxima	Reed Sweet-grass
Hippuris vulgaris	Mare's-tail
Laburnum anagyroides	Laburnum
Lamium album	White Dead-nettle
Lapsana communis	Nipplewort
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Lolium perenne	Perennial Rye-grass
Lotus corniculatus	Common Bird's-foot Trefoil
Lycopus europaeus	Gipsywort
Lythrum salicaria	Purple Loosetrife
Malus pumila	Apple
Matricaria discoidea	Pineappleweed
Myosotis sylvatica	Wood Forget-me-not
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Prunus avium	Wild Cherry
Rubus fruticosa agg.	Bramble
Rumex hydrolapathum	Water Dock
Sagina procumbens	Procumbent Pearlwort
Senecio viscosus	Sticky Groundsel
Senecio vulgaris	Groundsel
Sisymbrium officinalis	Hedge Mustard
Solidago canadensis	Canadian Golden-rod
Sonchus oleraceus	Smooth Sow-thistle
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stellaria media	Common Chickweed
Syringa vulgaris	Lilac
Taraxacum officinale agg.	Dandelion
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Urtica dioica	Common Nettle

WV020:8 Pinfold Bridge - Wards Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Aesculus hippocastanum	Horse-chestnut
Agrostis stolonifera	Creeping Bent
Alisma lanceolata	Narrow-leaved Water-plantain
Alliaria petiolata	Garlic Mustard
Anthriscus sylvestris	Cow Parsley
Arrhenatherum elatius	False Oat-grass
Asplenium trichomanes	Maidenhair Spleenwort
Calystegia silvatica	Large Bindweed
Carex otrubae	False Fox-sedge
Cerastium fontanum	Common Mouse-ear
Circium arvense	Creeping Thistle
Conyza canadensis	Canadian Fleabane
Cornus sanguinea	Dogwood
Corylus avellana	Hazel
Cotoneaster horizontalis	Wall Cotoneaster
Crataegus monogyna	Hawthorn
Dryopteris filix-mas	Male-fern
Epilobium ciliatum	American Willowherb
Epilobium hirsutum	Great Willowherb
Epilobium roseum	Pale Willowherb
Equisetum arvense	Field Horsetail
Fallopia japonica	Japanese Knotweed
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Hedera helix	Ivy
Hieracium sp	a Hawkweed
Hippuris vulgaris	Mare's-tail
Ilex aquifolium	Holly
Lamiastrum galeobdolon ssp. argentatum	Yellow Archangel
Lapsana communis	Nipplewort
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumnal Hawkbit
Ligustrum vulgare	Wild Privet
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lycopus europaeus	Gipsywort
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Prunus domestica	Wild Plum
Rubus fruticosa agg.	Bramble
Rumex hydrolapathum	Water Dock
Sagina procumbens	Procumbent Pearlwort
Salix caprea	Goat Willow
Salix fragilis	Crack Willow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Sisymbrium officinalis	Hedge Mustard

Sonchus arvensis	Perennial Sow-thistle
Sonchus oleraceus	Smooth Sow-thistle
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stellaria media	Common Chickweed
Symphoricarpos albus	Snowberry
Symphytum x uplandicum	Russian Comfrey
Taraxacum officinale agg.	Dandelion
Tussilago farfara	Colt's-foot
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle
Viola riviniana	Common Dog-violet

WV020:9 Wards Bridge - Moat House Bridge (16th September 2013)	
Scientific name	**Common name**
Acer campestre	Field Maple
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alchemilla mollis	Soft Lady's-mantle
Alisma lanceolata	Narrow-leaved Water-plantain
Alnus glutinosa	Alder
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Berula erecta	Lesser Water-parsnip
Butomus umbellatus	Flowering Rush
Calystegia silvatica	Large Bindweed
Carex otrubae	False Fox-sedge
Cerastium tomentosum	Snow-in-summer
Chamerion angustifolium	Rosebay Willowherb
Circium arvense	Creeping Thistle
Cornus sanguinea	Dogwood
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth Hawk's-beard
Dryopteris filix-mas	Male-fern
Epilobium hirsutum	Great Willowherb
Fallopia baldschuanica	Russian-vine
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Galium aparine	Cleavers
Geum urbanum	Herb Bennet
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Hieracium sp	a Hawkweed
Hippuris vulgaris	Mare's-tail
Holcus mollis	Creeping Soft-grass
Hordeum murinum	Wall Barley
Ilex aquifolium	Holly
Lamium album	White Dead-nettle
Lapsana communis	Nipplewort
Lathyrus pratensis	Meadow Vetchling
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumnal Hawkbit
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lycopus europaeus	Gipsywort

Mentha aquatica	Water Mint
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Persicaria amphibia	Amphibious Bistort
Pilosella aurantiaicum	Fox-and-cubs
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Prunus avium	Wild Cherry
Prunus domestica	Wild Plum
Quercus robur	Pedunculate Oak
Ranunculus repens	Creeping Buttercup
Rosa canina agg.	Dog Rose
Rosa rugosa	Japanese Rose
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Salix fragilis	Crack Willow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Senecio vulgaris	Groundsel
Sisymbrium officinalis	Hedge Mustard
Sonchus arvensis	Perennial Sow-thistle
Sonchus asper	Prickly Sow-thistle
Sonchus oleraceus	Smooth Sow-thistle
Sparganium erectum	Branched Bur-reed
Stachys sylvatica	Hedge Woundwort
Symphoricarpos albus	Snowberry
Taraxacum officinale agg.	Dandelion
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Typha latifolia	Great Reedmace
Urtica dioica	Common Nettle

WV020: 10 Moat House Bridge - Devil's Elbow Bridge (16th September 2013)	
Scientific name	**Common name**
Acer platanoides	Norway Maple
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alliaria petiolata	Garlic Mustard
Alnus glutinosa	Alder
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Armoracia rusticana	Horseradish
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Asplenium scolopendrium	Hart's-tongue
Asplenium trichomanes	Maidenhair Spleenwort
Berula erecta	Lesser Water-parsnip
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's-purse
Cardamine hirsuta	Hairy Bitter-cress
Carex otrubae	False Fox-sedge
Cerastium tomentosum	Snow-in-summer
Chamerion angustifolium	Rosebay Willowherb

Circium arvense	Creeping Thistle
Corylus avellana	Hazel
Cotoneaster horizontalis	Wall Cotoneaster
Cotoneaster rehderi	Bullate Cotoneaster
Crataegus monogyna	Hawthorn
Dactylis glomerata	Cock's-foot
Dryopteris filix-mas	Male-fern
Epilobium hirsutum	Great Willowherb
Equisetum arvense	Field Horsetail
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Geranium endressii	French Crane's-bill
Geum urbanum	Herb Bennet
Glyceria maxima	Reed Sweet-grass
Heracleum sphondylium	Hogweed
Hippuris vulgaris	Mare's-tail
Iris pseudacorus	Yellow Iris
Lamium album	White Dead-nettle
Lapsana communis	Nipplewort
Lathyrus pratensis	Meadow Vetchling
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumnal Hawkbit
Lycopus europaeus	Gipsywort
Matricaria discoidea	Pineappleweed
Medicago lupulina	Black Medick
Mentha aquatica	Water Mint
Myosotis sylvatica	Wood Forget-me-not
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Persicaria amphibia	Amphibious Bistort
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygonum aviculare agg.	Knot-grass
Prunus avium	Wild Cherry
Prunus domestica	Wild Plum
Prunus laurocerasus	Cherry Laurel
Pteridium aquilinum	Bracken
Quercus robur	Pedunculate Oak
Ranunculus lingua	Greater Spearwort
Ranunculus repens	Creeping Buttercup
Reseda luteola	Weld
Rhus typhina	Stag's-horn Sumach
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Rumex obtusifolius	Broad-leaved Dock
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Sonchus oleraceus	Smooth Sow-thistle
Sparganium erectum	Branched Bur-reed
Stellaria media	Common Chickweed
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Ulex europaeus	Gorse
Urtica dioica	Common Nettle

Viburnum opulus	Guelder-rose
Vicia cracca	Tufted Vetch

WV020: 11 Devil's Elbow Bridge – Olinthus Bridge	
Scientific name	**Common name**
Acer campestre	Field Maple
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alnus glutinosa	Alder
Anthriscus sylvestris	Cow Parsley
Arrhenatherum elatius	False Oat-grass
Buddleja davidii	Butterfly-bush
Buddleja davidii	Butterfly-bush
Buddleja x weyeriana	Weyer's Butterfly-bush
Calystegia silvatica	Large Bindweed
Cerastium fontanum	Common Mouse-ear
Crataegus monogyna	Hawthorn
Dactylis glomerata	Cock's-foot
Dryopteris filix-mas	Male-fern
Fraxinus excelsior	Ash
Galium aparine	Cleavers
Geranium robertianum	Herb-robert
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hippuris vulgaris	Mare's-tail
Iris pseudacorus	Yellow Iris
Lamium album	White Dead-nettle
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Lycopus europaeus	Gipsywort
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Persicaria amphibia	Amphibious Bistort
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Prunus avium	Wild Cherry
Ranunculus acris	Meadow Buttercup
Ranunculus repens	Creeping Buttercup
Rorippa amphibia	Greater Yellow-cress
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Rumex obtusifolius	Broad-leaved Dock
Salix cinerea	Grey Willow
Salix fragilis	Crack Willow
Salix x sepulcraris	Weeping Willow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Sisymbrium officinalis	Hedge Mustard
Sonchus oleraceus	Smooth Sow-thistle
Sparganium erectum	Branched Bur-reed
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Typha latifolia	Great Reedmace
Vicia cracca	Tufted Vetch

WV020: 12 Olinthus Bridge – Castle Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alnus glutinosa	Alder
Anthriscus sylvestris	Cow Parsley
Arrhenatherum elatius	False Oat-grass
Buddleja davidii	Butterfly-bush
Butomus umbellatus	Flowering Rush
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's-purse
Carex pendula	Pendulous Sedge
Chelidonium majus	Greater Celandine
Circium arvense	Creeping Thistle
Crataegus monogyna	Hawthorn
Dactylis glomerata	Cock's-foot
Dryopteris filix-mas	Male-fern
Epilobium hirsutum	Great Willowherb
Equisetum arvense	Field Horsetail
Fallopia baldschuanica	Russian-vine
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Galium aparine	Cleavers
Glyceria maxima	Reed Sweet-grass
Heracleum sphondylium	Hogweed
Hieracium sp.	a Hawkweed
Hippuris vulgaris	Mare's-tail
Hordeum murinum	Wall Barley
Ilex aquifolium	Holly
Lamium album	White Dead-nettle
Lathyrus pratensis	Meadow Vetchling
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumnal Hawkbit
Lycopus europaeus	Gipsywort
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Parthenocissus quinquefolia	Virginia-creeper
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygonum aviculare agg.	Knot-grass
Populus alba	White
Prunus avium	Wild Cherry
Prunus domestica	Wild Plum
Quercus robur	Pedunculate Oak
Ranunculus repens	Creeping Buttercup
Rhus typhina	Stag's-horn Sumach
Rubus fruticosa agg.	Bramble
Rumex hydrolapathum	Water Dock
Rumex obtusifolius	Broad-leaved Dock
Salix caprea	Goat Willow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Senecio jacobaea	Common Ragwort
Sisymbrium officinalis	Hedge Mustard
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed

Stellaria media	Common Chickweed
Taraxacum officinale agg.	Dandelion
Tilia x europaea	Common Lime
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Ulex europaeus	Gorse
Veronica chamaedrys	Germander Speedwell
Vicia cracca	Tufted Vetch
Vicia sepium	Bush Vetch

WV020: 13 Castle Bridge – Perry Hall Bridge (16th September 2013)	
Scientific name	**Common name**
Acer pseudoplatanus	Sycamore
Agrostis stolonifera	Creeping Bent
Alisma lanceolata	Narrow-leaved Water-plantain
Alliaria petiolata	Garlic Mustard
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Arrhenatherum elatius	False Oat-grass
Artemisia vulgaris	Mugwort
Asplenium scolopendrium	Hart's-tongue
Buddleja davidii	Butterfly-bush
Calystegia silvatica	Large Bindweed
Crataegus monogyna	Hawthorn
Epilobium hirsutum	Great Willowherb
Equisetum arvense	Field Horsetail
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Geum urbanum	Herb Bennet
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Hippuris vulgaris	Mare's-tail
Ilex aquifolium	Holly
Lamium album	White Dead-nettle
Lathyrus pratensis	Meadow Vetchling
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Ligustrum ovalifolium	Garden Privet
Lolium perenne	Perennial Rye-grass
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lycopus europaeus	Gipsywort
Matricaria discoidea	Pineappleweed
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygonum aviculare agg.	Knot-grass
Prunus laurocerasus	Cherry Laurel
Pteridium aquilinum	Bracken
Quercus robur	Pedunculate Oak
Ranunculus repens	Creeping Buttercup
Riccia fluitans	Crystalwort
Rosa canina agg.	Dog Rose
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock

Rumex obtusifolius	Broad-leaved Dock
Salix caprea	Goat Willow
Salix fragilis	Crack Willow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Sisymbrium officinalis	Hedge Mustard
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Symphoricarpos albus	Snowberry
Symphytum x uplandicum	Russian Comfrey
Taraxacum officinale agg.	Dandelion
Trifolium repens	White Clover
Typha latifolia	Great Reedmace
Ulex europaeus	Gorse
Urtica dioica	Common Nettle
Vicia cracca	Tufted Vetch

Complete Botanical Species List (16th September 2013)	
Scientific name	**Common name**
Acer campestre	Field Maple
Acer platanoides	Norway Maple
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Aegopodium podagraria	Ground-elder
Aesculus hippocastanum	Horse-chestnut
Aethusa cynapium	Fool's Parsley
Agrostis stolonifera	Creeping Bent
Alchemilla mollis	Soft Lady's-mantle
Alisma lanceolata	Narrow-leaved Water-plantain
Alliaria petiolata	Garlic Mustard
Alnus cordata	Italian Alder
Alnus glutinosa	Alder
Alnus incana	Grey Alder
Anthriscus sylvestris	Cow Parsley
Apium nodiflorum	Fool's Water-cress
Arctium minus	Lesser Burdock
Armoracia rusticana	Horseradish
Arrhenatherum elatius	False Oat-grass
Artemisia absinthium	Wormwood
Artemisia vulgaris	Mugwort
Asplenium ruta-muraria	Wall-rue
Asplenium scolopendrium	Hart's-tongue
Asplenium trichomanes	Maidenhair Spleenwort
Atriplex patula	Common Orache
Bellis perennis	Daisy
Berula erecta	Lesser Water-parsnip
Betula pendula	Silver Birch
Bidens frondosa	Beggarticks
Buddleja davidii	Butterfly-bush
Buddleja x weyeriana	Weyer's Butterfly-bush
Butomus umbellatus	Flowering Rush
Calystegia sepium	Hedge Bindweed
Calystegia silvatica	Large Bindweed
Capsella bursa-pastoris	Shepherd's-purse
Cardamine hirsuta	Hairy Bitter-cress
Carex otrubae	False Fox-sedge
Carex pendula	Pendulous Sedge

Carex rostrata	Bottle Sedge
Castanea sativa	Sweet Chestnut
Centaurea nigra	Common Knapweed
Cerastium fontanum	Common Mouse-ear
Cerastium tomentosum	Snow-in-summer
Chamerion angustifolium	Rosebay Willowherb
Chelidonium majus	Greater Celandine
Circium arvense	Creeping Thistle
Circium vulgaris	Spear Thistle
Convolvulus arvensis	Field Bindweed
Conyza canadensis	Canadian Fleabane
Cornus sanguinea	Dogwood
Corylus avellana	Hazel
Cotoneaster horizontalis	Wall Cotoneaster
Cotoneaster rehderi	Bullate Cotoneaster
Cotoneaster salicifolia	Willow-leaved Cotoneaster
Cotoneaster sp.	A Cotoneaster
Cotoneaster x watereri	Waterer's Cotoneaster
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth Hawk's-beard
Dryopteris filix-mas	Male-fern
Epilobium ciliatum	American Willowherb
Epilobium hirsutum	Great Willowherb
Epilobium parviflorum	Hoary Willow-herb
Equisetum arvense	Field Horsetail
Euphorbia peplus	Petty Spurge
Fallopia baldschuanica	Russian-vine
Fallopia japonica	Japanese Knotweed
Festuca rubra agg.	Red Fescue
Fraxinus excelsior	Ash
Galium aparine	Cleavers
Geranium endressii	French Crane's-bill
Geranium pusillum	Small-flowered Crane's-bill
Geranium robertianum	Herb-robert
Geum urbanum	Herb Bennet
Glyceria maxima	Reed Sweet-grass
Hedera helix	Ivy
Heracleum sphondylium	Hogweed
Hieracium sp.	a Hawkweed
Hippuris vulgaris	Mare's-tail
Holcus mollis	Creeping Soft-grass
Hordeum murinum	Wall Barley
Humulus lupulus	Hop
Ilex aquifolium	Holly
Iris pseudacorus	Yellow Iris
Laburnum anagyroides	Laburnum
Lamiastrum galeobdolon ssp. argentatum	Yellow Archangel
Lamium album	White Dead-nettle
Lapsana communis	Nipplewort
Lathyrus pratensis	Meadow Vetchling
Lemna minor	Common Duckweed
Lemna trisulca	Ivy-leaved Duckweed
Leontodon autumnalis	Autumnal Hawkbit
Ligustrum ovalifolium	Garden Privet
Ligustrum vulgare	Wild Privet
Lolium perenne	Perennial Rye-grass
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Common Bird's-foot Trefoil

Lycopus europaeus	Gipsywort
Lythrum salicaria	Purple Loosetrife
Malus pumila	Apple
Matricaria discoidea	Pineappleweed
Medicago lupulina	Black Medick
Mentha aquatica	Water Mint
Myosotis sylvatica	Wood Forget-me-not
Nuphar lutea	Yellow Water-lily
Nymphaea alba	White Water-lily
Oenanthe crocata	Hemlock Water-dropwort
Parthenocissus quinquefolia	Virginia-creeper
Persicaria amphibia	Amphibious Bistort
Pilosella aurantiaicum	Fox-and-cubs
Pilosella officinarum	Mouse-ear Hawkweed
Plantago lanceolata	Ribwort Plantain
Plantago major	Greater Plantain
Poa annua	Annual Meadow-grass
Polygonum aviculare agg.	Knot-grass
Populus alba	White
Populus x canadensis	Hybrid Black Poplar
Potentilla reptans	Creeping Cinquefoil
Prunus avium	Wild Cherry
Prunus domestica	Wild Plum
Prunus laurocerasus	Cherry Laurel
Pteridium aquilinum	Bracken
Quercus robur	Pedunculate Oak
Ranunculus acris	Meadow Buttercup
Ranunculus lingua	Greater Spearwort
Ranunculus repens	Creeping Buttercup
Reseda luteola	Weld
Rhus typhina	Stag's-horn Sumach
Riccia fluitans	Crystalwort
Rorippa amphibia	Greater Yellow-cress
Rosa canina agg.	Dog Rose
Rosa rugosa	Japanese Rose
Rubus fruticosa agg.	Bramble
Rumex conglomeratus	Clustered Dock
Rumex hydrolapathum	Water Dock
Rumex obtusifolius	Broad-leaved Dock
Sagina procumbens	Procumbent Pearlwort
Salix caprea	Goat Willow
Salix cinerea	Grey Willow
Salix fragilis	Crack Willow
Salix x sepulcraris	Weeping Willow
Sambucus nigra	Elder
Schoenoplectus lacustris	Common Club-rush
Scutellaria galericulata	Skullcap
Senecio jacobaea	Common Ragwort
Senecio squalidus	Oxford Ragwort
Senecio viscosus	Sticky Groundsel
Senecio vulgaris	Groundsel
Sisymbrium officinalis	Hedge Mustard
Solidago canadensis	Canadian Golden-rod
Sonchus arvensis	Perennial Sow-thistle
Sonchus asper	Prickly Sow-thistle
Sonchus oleraceus	Smooth Sow-thistle
Sorbus aria agg.	Whitebeam
Sorbus intermedia	Swedish Whitebeam
Sparganium emersum	Unbranched Bur-reed

Sparganium erectum	Branched Bur-reed
Stachys sylvatica	Hedge Woundwort
Stellaria media	Common Chickweed
Symphoricarpos albus	Snowberry
Symphytum x uplandicum	Russian Comfrey
Syringa vulgaris	Lilac
Taraxacum officinale agg.	Dandelion
Tilia x europaea	Common Lime
Trifolium pratense	Red Clover
Trifolium repens	White Clover
Tussilago farfara	Colt's-foot
Typha latifolia	Great Reedmace
Ulex europaeus	Gorse
Urtica dioica	Common Nettle
Verbascum thapsus	Great Mullein
Veronica chamaedrys	Germander Speedwell
Viburnum opulus	Guelder-rose
Vicia cracca	Tufted Vetch
Vicia sativa ssp. segetalis	Common Vetch
Vicia sepium	Bush Vetch
Viola riviniana	Common Dog-violet
Vulpia myuros	Rat's-tail Fescue

Birds (16th September 2013)

Scientic name	**Common name**
Anas platyrhynchos	Mallard
Branta canadensis	Canada Goose
Buteo buteo	Buzzard
Columba palumbus	Woodpigeon
Corvus corone	Carrion Crow
Cygnus olor	Mute Swan
Fulica atra	Coot
Gallinula chloropus	Moorhen
Passer domesticus	House Sparrow
Pica pica	Magpie
Turdus merula	Blackbird

Fish (16th September 2013)

Scientific name	**Common name**
Anguilla anguilla	European Eel (reported by fisherman)
Esox lucius	Pike
Perca fluviatilis	Perch
Rutilus rutilus	Roach

Invertebrates (16th September 2013)

Scientific name	**Common name**
Aeshna grandis	Brown Hawker
Aeshna mixta	Migrant Hawker
Pararge aegeria	Speckled Wood
Pieris brassicae	Large White
Pieris rapae	Small White
Sympetrum striolatum	Common Darter

Mammals (16th September 2013)

Scientific name	Common name
Rattus norvegicus	Brown Rat

14 Appendix 8 – Wyrley & Essington Ecological Survey: Walsall Metropolitan Borough Council

A full ecological survey was carried out by local authority ecologists during July 2014. The stretch of Wyrley and Essington canal running through the Walsall Metropolitan Borough Council area was sub-divided into nine sections. The full definition of these section can be found in the table below.

Section	Geographical Location
1	Catshill Junction to Beck's Bridge
2	Beck's Bridge to York's Bridge
3	York's Bridge to Pelsall Works Bridge
4	Pelsall Works Bridge to Hildick's Bridge
5	Hildick's Bridge to Birchills Junction
6	Birchills Junction to Brick Kiln Bridge
7	Brick Kiln Bridge to M6 Motorway Bridge
8	M6 Motorway Bridge to Adam and Eve Bridge
9	Adam and Eve Bridge to Perry Hall Bridge

The tables below detail the recorded botanical and animal biodiversity.

Botanical		Section								
		01/07/14	03/07/14	08/07/14	08/07/14	10/07/14	15/07/14	22/07/14	22/07/14	22/07/14
Scientific Name	**Common Name**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Acer campestre	Field Maple	X		X		X	X		X	
Acer pseudoplatanus	Sycamore	X			X	X	X	X	X	X
Achillea millefolium	Yarrow	X	X	X	X	X	X	X	X	
Aegopodium podagraria	Ground-elder	X	X		X					
Agrostis capillaris	Common Bent				X	X	X	X	X	X
Agrostis sp	Bent sp.			X	X					
Agrostis stolonifera	Creeping Bent						X			
Alisma lanceolatum	Narrow-leaved Water-plantain	X	X		X	X	X	X	X	X
Alisma plantago-aquatica	Water-plantain						X		X	X
Alliaria petiolata	Garlic Mustard		X							X
Alnus glutinosa	Alder	X	X		X	X	X	X		X
Anisantha sterilis	Barren Brome		X							X
Anthoxanthum odoratum	Sweet Vernal-grass				X					
Anthriscus sylvestris	Cow Parsley	X	X	X	X	X	X	X	X	X
Apium nodiflorum	Fool's-water-cress	X								
Aquelegia	Columbine		X							
Arctium sp.	Burdock sp.	X								
Armoracia rusticana	Horse-radish	X		X			X			

Arrhenatherum elatius	False Oat-Grass	X	X	X	X	X	X	X	X	X
Artemisia absinthium	Wormwood			X	X			X	X	
Artemisia vulgaris	Mugwort	X	X	X	X	X	X	X	X	X
Asplenium adiantum-nigrum	Black Spleenwort		X		X	X	X	X		
Asplenium trichomanes	Maidenhair Spleenwort			X		X	X			
Avena sativa	Oat									X
Bellis perennis	Daisy	X	X	X	X	X	X	X		X
Berula erecta	Lesser Water-parsnip	X	X		X	X	X	X	X	X
Betula pendula	Silver Birch	X	X	X	X	X	X	X	X	
Betula sp.	Birch sp.			X						
Borago officinalis	Borage	X								
Brassica nigra	Black Mustard	X								
Bryonia dioica	White Bryony	X	X		X	X				
Buddleja davidii	Butterfly-bush	X			X	X	X	X		X
Butomus umbellatus	Flowering-rush	X	X	X	X	X	X	X	X	X
Callitriche agg.	Water-starwort						X	X		X
Calystegia sepium	Hedge Bindweed				X		X	X	X	
Calystegia sepium subsp. sepium f. colorata	Hedge Bindweed (Pink Form)				X					
Calystegia silvatica	Large Bindweed	X	X			X				X
Campanula poscharskyana	Trailing Bellflower	X								
Campanula rapunculoides	Creeping Bellflower	X								
Campanulaceae	Bellflower family						X			X
Capsella bursa-pastoris	Shepherd's-purse		X		X		X	X		
Cardamine amara	Large Bitter-cress	X								
Cardamine hirsuta	Hairy Bitter-cress		X							
Cardamine pratensis	Cuckooflower	X					X			
Carduus nutans	Musk Thistle						X			
Carex otrubae	False Fox-sedge		X	X	X	X	X		X	
Centaurea nigra	Common Knapweed	X	X	X	X	X	X	X	X	
Centaurium erythraea	Common Centaury								X	
Cerastium fontanum	Common Mouse-ear	X	X	X	X	X	X	X	X	X
Cerastium tomentosum	Snow-in-summer				X					
Chamerion angustifolium	Rosebay Willowherb	X	X	X	X	X	X	X	X	X
Chelidonium majus	Greater Celandine		X							
Cirsium arvense	Creeping Thistle	X	X			X	X	X		X
Cirsium palustre	Marsh Thistle		X	X	X	X			X	
Cirsium vulgare	Spear Thistle	X	X	X	X	X	X	X		X
Clematis vitalba	Traveller's-joy					X				
Convolvulus arvensis	Field Bindweed				X	X		X		X
Conyza canadensis	Canadian Fleabane					X				
Cornus sanguinea	Dogwood	X			X	X	X			
Corylus avellana	Hazel	X	X		X	X	X	X		X

Cotoneaster sp.	Cotoneaster sp.	X	X		X			X		X
Crataegus monogyna	Hawthorn	X	X	X	X	X	X	X	X	X
Crepis capillaris	Smooth Hawk's-beard		X		X					
Crocosmia × crocosmiiflora	Montbretia									X
Cupressus × leylandii	Leyland cypress		X			X				
Cymbalaria muralis	Ivy-leaved Toadflax									X
Cynosurus cristatus	Crested Dog's-tail							X		
Cytisus scoparius	Broom				X	X	X	X	X	
Dactylis glomerata	Cock's-foot	X	X	X	X	X	X	X	X	X
Dactylorhiza fuchsii	Common Spotted Orchid								X	
Dactylorhiza praetermissa	Southern Marsh Orchid			X	X	X	X			
Dactylorhiza x grandis	Common Spotted x Southern Marsh Orchid			X						
Daucus carota subsp. carota	Wild Carrot	X								
Deschampsia cespitosa	Tufted Hair-grass	X					X			
Deschampsia flexuosa	Wavy Hair-grass	X	X	X	X		X			
Digitalis purpurea	Foxglove		X		X		X			
Dipsacus fullonum	Wild Teasel					X				
Dryopteris dilatata	Broad Buckler-fern		X			X				
Dryopteris filix-mas agg.	Common Male Fern	X	X	X			X	X	X	X
Elodea nuttallii	Nuttall's Waterweed				X			X		
Elymus repens	Couch		X							
Elytrigia repens	Common Couch				X		X			
Epilobium ciliatum	American Willowherb		X		X	X	X		X	X
Epilobium hirsutum	Great Willowherb	X	X	X	X		X	X	X	X
Epilobium montanum	Broad-leaved Willowherb	X	X		X					X
Equisetopsida	Horsetail sp			X				X		
Equisetum arvense	Field Horsetail	X	X		X	X	X	X	X	X
Eucalyptus sp.	Eucalyptus sp.		X		X					
Eupatorium cannabinum	Hemp-agrimony		X	X	X	X	X			
Euphrasia officinalis agg.	Eyebright		X		X			X		
Fallopia japonica	Japanese Knotweed						X	X		
Festuca sp.	Fescue sp.						X			
Filipendula ulmaria	Meadowsweet	X	X		X					
Fraxinus excelsior	Ash	X	X	X	X	X	X	X		X
Galeopsis tetrahit	Common Hemp-nettle									X
Galium aparine	Cleavers	X	X	X	X	X	X	X	X	X
Galium palustre	Marsh-bedstraw	X	X	X	X	X	X	X		X
Galium verum	Lady's Bedstraw				X			X		
Geraniaceae	Crane's-bill family	X	X							
Geranium dissectum	Cut-leaved Crane's-bill	X								X
Geranium molle	Dove's-foot Crane's-bill				X					X
Geranium pratense	Meadow Crane's-bill	X								

Geranium pyrenaicum	Hedgerow Crane's-bill							X		
Geranium robertianum	Herb-Robert	X	X		X	X	X		X	X
Geum urbanum	Wood Avens	X			X					X
Glyceria maxima	Reed Sweet-grass		X	X	X		X	X	X	X
Glyceria sp.	Sweet-grass sp.	X								
Haloragaceae	Water-milfoil family				X					
Hebe x franciscana	Hedge Veronica						X			
Hedera helix	Common Ivy	X	X	X	X	X	X	X	X	X
Heracleum sphondylium	Hogweed	X	X	X	X	X	X	X	X	
Hieracium agg.	Hawkweed		X		X	X	X	X		X
Hippuris vulgaris	Mare's-tail	X	X	X	X	X	X			X
Holcus lanatus	Yorkshire-fog	X	X	X	X	X	X	X	X	X
Holcus mollis	Creeping Soft-grass					X		X	X	
Hordeum murinum	Wall Barley			X	X		X	X		X
Hyacinthoides non-scripta	Bluebell	X	X							
Hydrangea macrophylla	Hydrangea					X				
Hydrocotyle ranunculoides	Floating Pennywort									X
Hypericum calycinum	Rose-of-Sharon		X		X					
Hypericum pulchrum	Slender St. John's-wort				X					
Hypericum tetrapterum	Square-stalked St John's-wort		X		X	X				
Hypochaeris radicata	Cat's-ear								X	
Ilex aquifolium	Holly	X	X		X	X	X			X
Impatiens capensis	Orange Balsam					X				
Impatiens glandulifera	Indian Balsam	X								
Iris pseudacorus	Yellow Iris	X	X	X	X	X	X	X	X	X
Jasminum beesianum	Red Jasmine	X								
Laburnum anagyroides	Laburnum					X				
Lactuca serriola	Prickly Lettuce						X			
Lactuca virosa	Great Lettuce					X				
Lamiastrum galeobdolon	Yellow Archangel						X			X
Lamium album	White Dead-nettle	X	X	X	X	X	X	X	X	X
Lapsana communis	Nipplewort		X		X	X	X	X		X
Larix sp.	Larch sp.								X	
Lathyrus odoratus	Sweet Pea				X					
Lathyrus pratensis	Meadow Vetchling	X	X		X	X		X	X	X
Lemna minor	Common Duckweed	X			X	X	X	X	X	X
Lemna trisulca	Ivy-leaved Duckweed						X			X
Lepidium campestre	Field Pepperwort						X			
Leucanthemum vulgare	Oxeye Daisy	X	X		X			X		
Ligustrum ovalifolium	Garden Privet				X	X				X
Linaria vulgaris	Common Toadflax	X	X			X	X			
Lolium perenne	Perennial Rye-grass	X	X	X	X	X	X	X	X	X

Lonicera periclymenum	Honeysuckle		X		X	X		X		X
Lotus corniculatus	Common Bird's-foot-trefoil	X	X	X	X	X	X	X	X	
Lupinus sp.	Lupin			X						
Luronium natans	Floating Water-plantain		X		X					
Lychnis flos-cuculi	Ragged-Robin					X				
Lycopus europaeus	Gypsywort	X	X	X	X	X	X	X	X	X
Lysimachia vulgaris	Yellow Loosestrife		X		X					X
Lythrum salicaria	Purple Loosestrife				X					
Mahonia sp.	Mahonia sp.		X		X	X				
Malus domestica	Apple	X	X		X		X	X		
Malva sylvestris	Common Mallow		X		X					X
Marchantia polymorpha	Common Liverwort						X	X		X
Matricaria discoidea	Pineappleweed	X	X	X	X		X	X	X	
Meconopsis cambrica	Welsh Poppy	X	X							
Medicago lupulina	Black Medick		X		X		X		X	X
Melilotus officinalis	Ribbed Melilot				X					X
Mentha aquatica	Water Mint	X	X	X	X	X	X	X	X	X
Mycelis muralis	Wall Lettuce							X		
Myosotis laxa	Tufted Forget-me-not		X							
Myosotis scorpioides	Water Forget-me-not	X	X		X	X	X	X	X	X
Myriophyllum spicatum	Spiked Water-milfoil	X	X							
Nuphar lutea	Yellow Water-lily	X	X	X	X	X	X	X	X	X
Nymphaea alba	White Water-lily		X		X	X	X	X	X	X
Nymphaeaceae	Water-lily family					X				X
Nymphoides peltata	Fringed Water-lily	X	X		X					
Odontites vernus	Red Bartsia			X	X	X		X		
Oenanthe crocata	Hemlock Water-dropwort	X	X	X	X	X	X	X	X	X
Oenothera agg.	Evening Primrose					X				
Pachycnemia hippocastanaria	Horse Chestnut					X		X		X
Papaver rhoeas	Field Poppy				X					
Papaver rhoeas	Common Poppy						X			
Pentaglottis sempervirens	Green Alkanet	X			X					
Persicaria amphibia	Amphibious Bistort				X		X	X		
Persicaria maculosa	Redshank		X							
Phalaris arundinacea	Reed Canary-grass		X		X					
Phleum pratense	Timothy			X	X			X		
Phyllitis scolopendrium	Hart's-tongue	X	X			X				X
Pilosella aurantiaca	Fox-and-cubs		X		X					
Pinaceae	Pine sp					X				
Pinus sylvestris	Scots Pine				X					
Plantago lanceolata	Ribwort Plantain	X	X	X	X	X	X	X	X	X
Plantago major	Greater Plantain	X	X	X	X	X	X	X	X	X

Poa annua	Annual Meadow-grass		X					X		X
Poa pratensis	Smooth Meadow-grass							X		
Poa trivialis	Rough Meadow-grass	X				X	X			
Populus nigra 'Italica'	Lombardy-poplar									X
Populus nigra sens. lat.	Poplar						X			
Populus sp.	Poplar sp.							X		
Populus tremula	Aspen			X						
Potamogeton lucens	Shining Pondweed	X								
Potamogeton natans	Broad-leaved Pondweed				X					
Potamogeton pectinatus	Fennel Pondweed	X	X	X	X	X	X	X		X
Potamogeton perfoliatus	Perfoliate Pondweed	X	X		X	X		X		
Potentilla reptans	Creeping Cinquefoil	X	X		X		X	X		
Prunella vulgaris	Selfheal	X	X			X	X	X		
Prunus avium	Wild Cherry	X				X			X	X
Prunus domestica subsp. domestica	Plum						X			
Prunus laurocerasus	Cherry Laurel	X	X		X			X		X
Prunus padus	Bird Cherry			X						
Prunus sp.	Prunus sp.				X					
Prunus spinosa	Blackthorn	X	X			X		X	X	
Pteridium aquilinum	Bracken	X	X		X	X		X	X	X
Pulicaria dysenterica	Common Fleabane							X		
Quercus cerris	Turkey Oak						X			
Quercus robur	Pedunculate Oak	X	X		X			X	X	X
Quercus sp.	Oak sp.			X				X		
Ranunculus acris	Meadow Buttercup	X	X	X	X	X	X	X	X	X
Ranunculus bulbosus	Bulbous Buttercup	X			X					
Ranunculus circinatus	Fan-leaved Water-crowfoot			X	X					
Ranunculus lingua	Greater Spearwort									X
Ranunculus repens	Creeping Buttercup	X	X			X			X	X
Reseda luteola	Weld				X				X	
Rorippa amphibia	Great Yellow-cress		X				X	X	X	
Rorippa nasturtium-aquaticum	Water-cress				X					
Rosa arvensis	Field-rose						X			
Rosa canina	Dog-rose	X	X			X	X			
Rosa rugosa	Japanese Rose	X			X	X	X	X		X
Rosa sp.	Rose sp.				X	X				X
Rubus fruticosus agg.	Bramble	X	X	X	X	X	X	X	X	X
Rubus idaeus	Raspberry		X		X					X
Rumex acetosa	Common Sorrel		X				X			
Rumex conglomeratus	Clustered Dock					X	X	X		
Rumex hydrolapathum	Water Dock	X	X		X	X	X	X	X	
Rumex obtusifolius	Broad-leaved Dock	X	X	X	X	X	X	X	X	X

Sagittaria sagittifolia	Arrowhead	X	X	X	X	X	X	X	X	X
Salicaceae	Willow family		X	X	X	X	X		X	
Salix alba	White Willow					X				
Salix babylonica	Weeping Willow				X				X	
Salix capraea	Goat Willow	X	X				X	X		X
Salix fragilis	Crack-willow	X			X			X		
Salix sp.	Sallow sp				X					
Salix sp.	Willow sp.							X		
Sambucus nigra	Elder	X	X	X	X	X	X	X	X	X
Saponaria officinalis	Soapwort						X			
Schoenoplectus lacustris	Common Club-rush	X	X	X	X		X	X	X	X
Scutellaria galericulata	Skullcap	X	X	X	X	X	X	X	X	X
Sedum kamtschaticum	Kamchatka Stonecrop									X
Senecio jacobaea	Common Ragwort	X	X	X	X	X	X	X	X	X
Silene dioica	Red Campion	X			X					
Silene latifolia	White Campion	X	X		X	X				
Silene vulgaris	Bladder Campion			X	X	X	X	X		
Sisymbrium officinale	Hedge Mustard		X		X	X		X		X
Solanum dulcamara	Bittersweet		X		X	X	X			X
Sonchus arvensis	Perennial Sow-thistle				X					
Sonchus asper	Prickly Sow-thistle	X	X		X	X		X	X	X
Sonchus oleraceus	Smooth Sow-thistle	X	X			X	X	X	X	
Sorbus aucuparia	Rowan		X		X	X	X			
Sparganium emersum	Unbranched Bur-reed	X	X	X	X	X	X	X	X	X
Sparganium erectum	Branched Bur-reed	X	X	X	X	X	X	X	X	X
Spiraea chamaedryfolia	Elm-leaved Spiraea				X	X				
Stachys officinalis	Betony					X				
Stachys sylvatica	Hedge Woundwort	X			X		X	X	X	X
Stellaria graminea	Lesser Stitchwort	X								
Stellaria media	Common Chickweed		X							
Symphoricarpos albus	Snowberry					X		X		X
Symphytum officinale	Common Comfrey	X	X			X				X
Symphytum x uplandicum	Russian Comfrey (S. asperum x officinale)					X				
Syringa vulgaris	Lilac		X		X					X
Tanacetum parthenium	Feverfew				X	X				
Taraxacum agg.	Dandelion		X	X	X	X	X	X	X	X
Taxus baccata	Yew							X		
Tragopogon pratensis	Goat's-beard	X			X	X	X	X		
Trifolium dubium	Lesser Trefoil	X	X	X	X	X	X	X		
Trifolium pratense	Red Clover	X		X	X	X	X	X	X	X
Trifolium repens	White Clover	X	X	X	X	X	X	X	X	X
Triticum aestivum	Bread Wheat	X	X							X

Tussilago farfara	Colt's-foot	X	X	X	X	X	X	X	X	X
Typha angustifolia	Lesser Reedmace			X	X					X
Typha latifolia	Greater Reedmace	X	X	X	X	X	X	X	X	X
Ulex europaeus	Gorse	X	X		X	X		X	X	X
Ulmus agg.	Elm									X
Urtica dioica	Common Nettle	X	X	X	X	X	X	X	X	X
Veronica longifolia	Garden Speedwell				X					
Veronica persica	Common Field Speedwell				X					
Vicia cracca	Tufted Vetch	X	X	X	X	X	X	X	X	X
Vicia hirsuta	Hairy Tare	X			X	X	X			
Vicia sativa	Common Vetch	X		X			X	X	X	
Vicia sepium	Bush Vetch	X	X			X	X		X	
Vicia tetrasperma	Smooth Tare	X								

Animals		**Section**								
		01/07/14	**03/07/14**	**08/07/14**	**08/07/14**	**10/07/14**	**15/07/14**	**22/07/14**	**22/07/14**	**22/07/14**
Scientific name	**Common name**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Mammals										
Sciurus carolinensis	Grey Squirrel		X							
Sorex araneus	Common Shrew				X					
Talpa europaea	Mole			X						
Birds										
Accipiter nisus	Sparrowhawk				X	X				
Alcedo atthis	Common Kingfisher	X								
Anas platyrhynchos	Mallard	X		X	X	X	X	X	X	X
Aegithalos caudatus	Long-tailed Tit		X		X	X		X	X	
Apus apus	Swift	X	X		X	X	X			X
Ardea cinerea	Grey Heron				X	X				
Branta canadensis	Canada Goose				X					
Buteo buteo	Common Buzzard		X		X					
Carduelis cannabina	Linnet				X					
Carduelis carduelis	Goldfinch	X	X			X	X	X		X
Carduelis chloris	Greenfinch		X		X	X	X	X		
Columba palumbus	Wood Pigeon	X	X		X	X		X		X
Corvus corone	Carrion Crow	X	X	X	X					X
Cygnus olor	Mute Swan							X		
Delichon urbicum	House Martin		X			X				
Dendrocopos major	Great Spotted Woodpecker							X		
Emberiza citrinella	Yellowhammer				X					
Erithacus rubecula	Robin		X				X	X		
Falco tinnunculus	Kestrel				X					
Fringilla coelebs	Chaffinch							X		
Fulica atra	Coot	X	X		X	X	X	X	X	X
Gallinula chloropus	Moorhen	X	X	X	X	X	X	X	X	X

Garrulus glandarius	Jay		X			X				
Hirundo rustica	Swallow		X	X	X					
Larus fuscus	Lesser Black-backed Gull	X	X							X
Larus ridibundus	Black-headed Gull		X	X	X		X			
Parus ater	Coal Tit				X					
Parus caeruleus	Blue Tit	X	X		X	X	X	X		X
Parus major	Great Tit					X		X		
Parus montanus	Willow Tit							X		
Passer domesticus	House Sparrow	X	X		X	X	X	X		X
Phylloscopus collybita	Chiffchaff	X	X	X	X	X		X		X
Pica pica	Magpie		X	X	X	X		X	X	
Picus viridis	Green Woodpecker				X					
Prunella modularis	Dunnock		X		X	X	X			
Pyrrhula pyrrhula	Bullfinch		X		X					
Regulus regulus	Goldcrest								X	
Sterna hirundo	Common Tern				X	X				
Streptopelia decaocto	Collared Dove							X		
Sturnus vulgaris	Starling		X		X					
Sylvia atricapilla	Blackcap		X			X	X		X	
Sylvia communis	Common Whitethroat		X		X	X				
Troglodytes troglodytes	Wren	X	X		X	X	X	X		X
Turdus merula	Blackbird		X			X	X	X		
Turdus philomelos	Song Thrush			X						
Amphibians										
Bufo bufo	Common Toad		X				X			
Rana temporaria	Common Frog		X			X		X		
Triturus vulgaris	Smooth Newt	X								
Coeloptera										
Adalia bipunctata	2-spot Ladybird				X					
Coccinella septempunctata	7-spot Ladybird	X	X		X		X			X
Harmonia axyridis	Harlequin Ladybird	X					X	X		X
Propylea quattuordecimpunctata	14-spot Ladybird	X								X
Chrysolina hyperici	a leaf beetle					X				
Chrysolina polita	a leaf beetle		X							
Cantharidae	Soldier beetles				X	X	X		X	
Oedemera nobilis	Swollen-thighed Beetle					X				
Palomena prasina	Green Shieldbug						X			
Pterostichus madidus	a ground beetle							X		
Diptera										
Cheilosia illustrata	a hoverfly							X		
Episyrphus balteatus	a hoverfly		X		X		X	X		
Eristalis tenax	a hoverfly				X					
Volucella bombylans	a hoverfly		X							
Volucella pellucens	a hoverfly	X								X
Volucella zonaria	a hoverfly					X				
Hemiptera										
Gerridae	Pond skaters	X	X		X	X	X	X	X	X
Gyrinidae	Whirligig beetles				X		X	X	X	
Hymenoptera										

Andrena bicolor	Gwynne's Mining Bee		X							
Apis mellifera	Honey Bee				X	X	X	X	X	
Bombus hortorum	Small Garden Bumble Bee				X				X	
Bombus hypnorum	a bumblebee	X	X					X		X
Bombus lapidarius	Large Red Tailed Bumble Bee	X			X	X		X	X	X
Bombus lucorum sens. str.	White-tailed Bumble Bee	X					X			X
Bombus pascuorum	Common Carder Bee	X		X	X	X	X	X		X
Bombus pratorum	Early Bumble Bee	X			X		X			X
Bombus terrestris	Buff-tailed Bumble Bee	X	X		X	X	X	X		X
Andricus quercuscalicis f. agamic	Knopper gall causer	X								X
Neuroterus quercusbaccarum f. agamic	Common spangle causer	X								X
Vespula vulgaris	Common Wasp	X					X	X		X
Lasius flavus	an ant		X							
Lepidoptera										
Tyria jacobaeae	Cinnabar		X		X		X	X		
Aglais urticae	Small Tortoiseshell		X		X	X	X	X		
Aphantopus hyperantus	Ringlet		X	X	X	X	X	X		
Gonepteryx rhamni	Brimstone							X		
Inachis io	Peacock	X						X	X	X
Maniola jurtina	Meadow Brown		X		X	X				
Pararge aegeria	Speckled Wood	X	X						X	X
Pieris brassicae	Large White	X			X			X		X
Pieris napi	Green-veined White	X					X	X	X	X
Polygonia c-album	Comma		X		X	X	X		X	
Pyronia tithonus	Gatekeeper	X			X	X	X	X	X	X
Thymelicus sylvestris	Small Skipper		X					X	X	
Vanessa atalanta	Red Admiral		X		X					
Odonata										
Aeshna grandis	Brown Hawker	X	X		X	X	X	X	X	X
Anax imperator	Emperor Dragonfly	X			X	X		X	X	X
Calopteryx splendens	Banded Demoiselle	X	X			X		X		X
Enallagma cyathigerum	Common Blue Damselfly		X		X	X	X	X		
Erythromma najas	Red-eyed Damselfly	X	X		X	X	X	X	X	X
Ischnura elegans	Blue-tailed Damselfly		X		X		X	X	X	
Myriapoda and Isopoda										
Brachygeophilus truncorum	a centipede		X							
Cryptops hortensis	a centipede						X			
Haplophilus subterraneus	a centipede		X							
Lithobius forficatus	a centipede						X			
Necrophloeophagus flavus	a centipede				X					
Cylindroiulus caeruleocinctus	a millipede						X			
Oniscus asellus	Common Shiny Woodlouse		X		X		X	X		
Porcellio scaber	Common Rough Woodlouse		X		X	X	X	X	X	
Mollusca										

Cepaea hortensis	White-lipped Snail							X		
Cepaea nemoralis	Grove or Brown-lipped Snail	X	X		X	X		X		X
Helix aspersa	Garden or Common Snail		X	X	X		X	X		