

Between 2007 and 2012, a partnership of organisations worked to secure the future of the Itchen Navigation, part of the River Itchen system.

This pamphlet describes some of the river engineering works undertaken to preserve and improve this precious waterway for wildlife and for people, as well as some of the accompanying events and activities which celebrated the wildlife and heritage of the Navigation.

It has been produced by the project partnership as a resource for those involved in managing the Itchen Navigation, and for those who have an interest in it.

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The Itchen Navigation Heritage Trail Project



Hampshire & Isle of Wight
Wildlife Trust
Protecting wildlife. Inspiring people.



Between 2007 and 2012, a partnership of organisations worked to secure the future of the Itchen Navigation, a major channel of the River Itchen system.

The crystal-clear waters of the chalk river provide a home for beautiful aquatic plants, rare insects, handsome trout and salmon, dazzling kingfishers, and elusive otters. The Navigation also boasts an industrial past, as an important component of the developing economy and agricultural systems of the Itchen Valley.

But the man-modified Navigation, completed over 300 years ago, began to crumble. Its banks, towpath, locks and sluices were in need of repair to prevent a catastrophic collapse which would threaten the wildlife, heritage and public enjoyment of this special river.

Organisations with an interest in the Navigation came together in partnership, with the aim of ‘securing the Itchen Navigation for the future’. They developed a project to repair the crumbling banks and eroded footpath, restore the degraded wildlife habitats, and increase awareness of the special qualities of the Navigation. The partners have worked with landowners, fishing clubs and others to achieve this ambitious aim, and as the project comes to an end, this pamphlet has been produced to showcase some of the works undertaken.

The partnership is grateful to land owners and managers along the Navigation for their support in undertaking these works.

The Itchen Navigation Project, 2007 – 2012

Front cover image: The Navigation at Hockley: Ali Morse

The project partners



The project was supported by the Heritage Lottery Fund, which provided £1.6M of funding towards the work of the partnership.



The Hampshire & Isle of Wight Wildlife Trust led the project on behalf of the partnership.



The Environment Agency championed the project, providing funding, support and technical input.



Natural England provided funding and technical input, facilitating engineering and habitat enhancement works.



Hampshire County Council Rights of Way team facilitated improvements to the Itchen Way.



Winchester City Council provided funding, and facilitated works within their district.



Eastleigh Borough Council provided funding, and facilitated works within their district.



Southampton City Council facilitated works within their district.



The Inland Waterways Association supported the heritage preservation work.

The value of volunteers

Throughout the project, over 200 volunteers contributed their time and expertise to a range of activities, helping to deliver the project's aims.

Trained volunteers undertook species surveys every year, recording bats, birds, dragonflies and damselflies, butterflies, otter and water vole. The results not only informed engineering works, but also showed how the Navigation's wildlife was responding to the changes.

Practical work delivered by volunteers included tree and scrub management, control of non-native invasive species, creation of bank-side habitat along the channel, reseedling of banks and path verges following engineering works, footpath maintenance, and fence repairs. These improvements complimented the larger-scale engineering works, and facilitated sensitive management of the adjacent habitats.

Training in historic brickwork preservation techniques also enabled volunteers to help restore some of the crumbling historic structures along the waterway. Photography, newsletter editing, and walk leading have also been carried out by volunteers.

As the end of the project drew near, a subset of the volunteers came together to form 'FIN', the Friends of the Itchen Navigation. FIN will continue to help monitor the Navigation, reporting or resolving problems, and so helping landowners to maintain the Navigation into the future.

The Friends of the Itchen Navigation will continue to work along the waterway past the life of the project.



Images: Matt Doggett, Polly Whyte

Foreword

Living close to the Itchen Navigation, I've enjoyed the stroll north from Eastleigh to Winchester or south to Woodmill in Southampton for many years. I enjoyed the tranquillity of this derelict waterway and began to understand its value to wildlife and, with the help of Edwin Course's book¹, to Hampshire's industrial and agricultural heritage. So by the time the River Itchen system was recognised firstly as being of national and later of European importance to nature, I was fully aware that the Navigation had reached the end of its life and was becoming quite fragile.

Once of local importance for water mills and irrigation as well as to barge traffic, these uses had long since disappeared, leaving the Navigation neglected and with no economic interest. Reaches around the airport had dried out, and the banks of other stretches perched above the valley floor were prone to breaches in winter allowing water to escape. Although this water passed across the valley to the river and was not lost from the system, it was potentially disastrous for wildlife in the Navigation dependent on reliable flows of clear, cool water. Occasional bank repairs were made by the Environment Agency and its predecessors, but with pressure to focus on the direct protection of people and property against flooding, environmental schemes such as these were becoming difficult to fund.

It seemed that statutory designation could protect a river against inappropriate development but not against the wear and tear of time, and every winter the towpath was deteriorating, making access for the public more difficult. Finance for a systematic programme of repair and maintenance would have to be found elsewhere, and it was a great relief when Hampshire & Isle of Wight Wildlife Trust offered to make a professional and ultimately successful bid to the Heritage Lottery Fund. This success can be measured by the numbers of walkers (and dogs) seen along the towpath, the thriving bankside vegetation and the redds now being cut by spawning fish – in other words, outcomes as important for people as they are for wildlife.

R Murchie

R Murchie

¹The history of the Itchen Navigation is described in Edwin Course's 'The Itchen Navigation', 2nd Edition (2011) published by Hampshire Industrial Archaeology Society (HIAS).

The importance of chalk rivers

Hampshire's residents are often only reminded of the special qualities of our chalk rivers when visitors from elsewhere comment on their clarity.



Chalk streams or rivers are so called because they are fed by water from chalk aquifers, found in the downs of lowland England. Rainwater is absorbed by the porous rocks and slowly released, buffering the effects of flood or drought and giving rise to rivers of a fairly constant flow.

The chalk river waters are stable in character too.

Rainwater held in the aquifers dissolves the chalk rocks and becomes alkaline. It is also protected from extremes of temperature whilst underground, and so has a constant cool temperature. The 'gin clear' waters are an indication that the riverbed deposits also derive from the chalk rocks and so lack the fine silts which muddy other rivers. These cool, clear, consistent waters provide ideal conditions for a range of aquatic plants and insects which thrive in the stable conditions, and these in turn support the salmon and trout fisheries for which rivers like the Itchen are world-renowned.

Over time, chalk rivers have been heavily modified by man, for milling, agriculture and navigation. The chalky waters which bathed the water meadows of the south of England were crucial to the success of this agricultural system, decreasing soil acidity and encouraging grass growth. More recently, our rivers have been managed as flood defences and water supplies, and the Itchen still provides drinking water to much of south Hampshire.

But they are not only important to man. The wildlife that depends upon them is often specific to chalk rivers, and like the rivers themselves, can therefore only be found where chalk geology occurs; in south & east England, and northern France & Belgium. The rivers, and their wildlife, are therefore globally rare.

Navigation-inspired community art

An Art Project was another way of promoting the importance of the site amongst local communities.

The project was delivered by a lead artist, who devised the concept, and put together a team to help her... The sounds of the Navigation's water and wildlife were captured by a sound recordist, who passed the tapes to a composer... The composer wrote a piece of music inspired by the burbling waters and buzzing insects, and passed this to a choreographer... He worked with local schoolchildren to develop a dance to the piece, brought to life with costumes produced by a screen printer... Families and school groups also worked with the screen printer to produce bunting and decorated barges like those that would have travelled along the Navigation. These were displayed on site, where the dance was performed through a huge piece of public artwork known as a land draw... The artist and her team marked on the ground the outline of giant images of salmon and eel - fish that both navigate along the Itchen on their journeys to or from their breeding grounds - and members of the public filled in sections of the image with their own small pieces of artwork. Bark, sands, vegetation and coloured pulses were used to create the giant images which then formed the stage for the dancers' performances.

Land draws and dance performances were the centrepieces of the two year art project and took place at Southampton, Eastleigh and Winchester, involving schools and communities local to each site. In all, over 2500 people took part.



Concept: Abigail Downer



Images: Rod Varley, Rehan Jamil, Ali Morse

Improving appreciation of the Navigation

The project not only aimed to repair the crumbling structures of the Navigation and to improve the habitat for wildlife, but also to improve the Navigation for people.

Access improvements went hand in hand with bank and habitat repairs, as a properly surfaced footpath helps to protect the repaired banks from erosion, and defined access along the footpath limits trampling and erosion of adjacent habitats. The improved footpaths and related infrastructure have made access safer and easier for visitors.

The project also aimed to improve public recognition and understanding of the Itchen Navigation. Intellectual access ensures that visitors to the site are more aware of its importance for wildlife and its interesting heritage, with an increased appreciation of the site's significance helping to reduce damaging activities.

A project launch, logo, leaflet, website, quarterly newsletter, on-site interpretation panels, way-marking, circular walks packs, education resources, conference, and a programme of walks and talks all served to increase awareness of the Navigation's importance, and inspire visitors to find out more about the site.



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Images: 1&3 Polly Whyte, 2&4 Dennis Bright,

Wildlife of the Itchen

A typical chalk river community dominates the River Itchen, and is the reason for its designation as a Special Area of Conservation under the EU Habitats Directive.

The attractive white flowers of water crowfoot, a chalk stream specialist, can be seen floating on the surface of the water from early summer. Lesser water parsnip and fool's water cress abound, and provide habitat for an exceptionally diverse community of aquatic invertebrates. Mayfly, caddis fly and damselfly larvae provide food for the river's fish, and emerge as adults providing fantastic aerial displays during the summer months. Abundant banded demoiselle are particularly striking, wings glinting in the sunshine, and eagle-eyed naturalists may also spot the globally rare southern damselfly.

Below the water's surface, bottom-dwelling bullhead and brook lamprey feed on insects, algae or detritus. Salmon and trout are the basis of economically important fisheries, and much has been done to tackle worryingly low salmon numbers. Habitat enhancements focus on preventing in-gravel eggs being choked by silt.

Along the Navigation's banks, margins dominated by sedges, reed sweet grass, branched bur-reed and purple loosestrife are home to water vole, often heard retreating to the safety of underwater burrows with a characteristic 'plop'. Footprints and spraint indicate the presence of the elusive otter. Birds such as coots, moorhens, kingfishers, wagtails & warblers are all resident along the waterway. Daubenton's bats swoop along the water's surface at dusk, and pipistrelles feed in the tree canopy. A threat uniting all of these species is the neglect of the Navigation, with erosion leading ultimately to collapse of the channel and loss of habitat.



Images: 1,2,3 Dennis Bright, 4 Rudolf Svenson

The Navigation's industrial roots

An Act of Parliament passed in 1665 heralded the start of construction on the Itchen Navigation. That and subsequent Acts allowed existing channels to be widened and deepened to accommodate barges, new cuts to be made across the floodplain, locks and sluices to be built to control water levels, and a towpath to be constructed along the Navigation's edge. The Acts also set out the payments the bargemen must make to the Navigation's operators, depending upon the goods carried and the distance travelled.

There were fifteen locks, two half locks, and numerous sluices along the Navigation, and these were operated to achieve a sufficient depth of water in the channel to float the barges. Tolls were supposed to be reinvested to pay for the upkeep of the Navigation's structures, but this did not always happen, and maintenance became a contentious issue.



The Navigation fell into disrepair

There was also competition for water; it was required for Navigation, but also to flood water meadows, and power mills, so water management too became contentious. The final straw for the Navigation came, however, with the advent of the railways. With the opening of the London to Southampton Railway in 1839, it became cheaper, and much faster, to transport goods by rail. The Navigation could not compete commercially, and the last barge to carry cargo on the Navigation floated in 1869.

With the loss of commercial use, the Navigation's structures fell into disrepair, but today, they provide a hint of its industrial past to walkers that stumble upon them.

Brambridge & St Catherine's: stabilising historic structures

North of Brambridge Lock existed an overgrown hatch-fed drain, believed to be part of a post-medieval water meadow system.

Vegetation clearance revealed that Brambridge Hatch was a large stone structure, with three hatches that took water from the Navigation. Metal hatch mechanisms were still present where the drain passed under the footpath. Material used to block the hatches had failed, and water was leaking into the structure, threatening it, and the Navigation's bank in which it sat, with collapse.



Stone-filled gabions prevent the stonework of Brambridge Hatch from collapsing

Stone gabions were installed in 2010, to support the structure and prevent further deterioration. A stepped design left the uppermost stonework exposed. Pipes installed underneath the gabions allowed water conveyance, and a replacement oak beam allowed the remaining cast iron hatch mechanism to be displayed.

Upstream at St Catherine's, the summit lock of the Itchen Navigation, obscuring and damaging vegetation growth was also removed. In

2010, crumbling brickwork was replaced or consolidated, re-pointed, and tied back to the banks behind. Three 'bat bricks' were installed in the SE gate pier to mitigate for the loss of any potential bat roost sites, and curved brickwork which housed a waterwheel is now clearly visible.



The site of the waterwheel that powered the adjacent timber mill is revealed at St Catherine's Lock.

Mansbridge Lock: preserving historic brickwork

The remains of Mansbridge Lock are the first now encountered on a walk up the Navigation. Few of the locks, sluices, and other structures present in its heyday now remain, and many are at risk of collapse, despite their historic interest.

The Navigation's locks were of an interesting construction, with stone or brickwork being used only to hold the gates at the head and tail of each lock. The chamber walls between them were built up using soil or chalk, consolidated by a covering of turf. Known as 'turf-sided locks', only a handful of other examples exist in the UK.

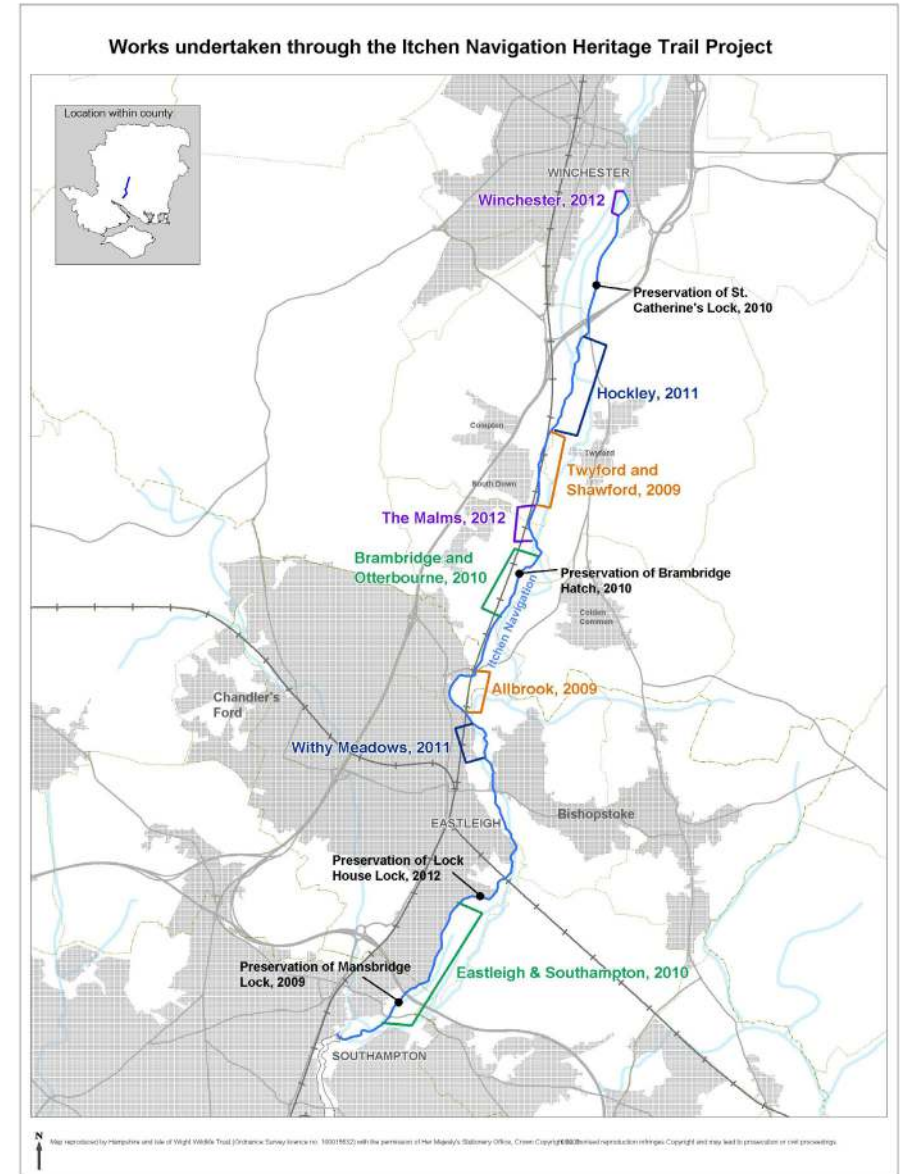
Mansbridge Lock was uncovered and restored in 2009. Vegetation and soil, which slowly destroy the bricks, were removed, and damaged



Contractors lay a bead of lime mortar to protect the restored brickwork below. Image: Dennis Bright

pointing was replaced. Bricks matching the dimension of the originals were sourced, and were laid to infill sections where bricks had been lost. Steel anchors tied the slumping walls back to the ground behind, preventing collapse. Finally, a protective capping of lime mortar was laid to protect the brickwork beneath.

Those locks in parts of the channel that no longer flow, such as at Mansbridge, have suffered less from erosion, and so are often more discernable. A dog-leg in the brickwork at Mansbridge Lock marks the point where the gates would have hung, allowing them to open back into the recess, so as not to protrude into the channel and snag the barges. Metal fixings also remain attached to the brickwork, which would have held timber cladding to protect it from damage.



Allbrook: rebuilding a chalk embankment



Rebuilding Allbrook's crumbling banks. Image Dennis Bright

Winter 2008 marked the start of engineering works, when work got underway at Allbrook to rebuild the crumbling banks. Here the 'perched' channel, raised above the surrounding landscape, had experienced bank collapses in the past, so was a priority for works.

As a first step, major tree works removed pressure from the crumbling embankment and allowed light through to the river and its margins.

A temporary bridge was positioned over the site of historic Ham Bridge, enabling access for machinery and materials, and preventing damage to the structure. Diggers and dumpers transported, laid, and compacted over 2000 tonnes of chalk to rebuild the embankment.

The eroded bank was widened to at least one metre wide at the top, to accommodate the footpath, and a back slope of 45 degrees provided stability. The footpath was resurfaced throughout the reach, and a spillway was installed upstream, to protect the bank and footpath from future high flows. Works were completed in early 2009.

Today, interpretation, circular routes and a 'story walk' aimed at families have increased use of this previously under-valued section of the Navigation, and the growth of chalk river plants and recolonisation by water voles mark a change in the character of the channel here.

The Malms: facilitating fish passage

The Navigation's historic locks are an important component of the site's history and were crucial to the waterway's commercial operation. Today however, those that still impound water behind them can cause problems for the wildlife of the Navigation.

South of Shawford, Malm Lock and College Mead Lock both held up water behind them. Such structures can be a barrier to fish passage, preventing struggling salmon from reaching potential habitat upstream. They also impact other species, as the sluggish silted waters above don't provide the habitat required by chalk stream specialists, and the high water levels can also put pressure on the banks, leading to overtopping, erosion, or even catastrophic collapse.

At College Mead, an aperture in the lock was widened to improve conveyance of water, preventing flows backing up and overtopping the banks upstream. However, water levels above Malm Lock were almost 2m above those downstream of it, and simply improving flows would not allow fish to overcome this barrier. Instead, a bypass channel was created around the side of the lock in 2012. This new channel was excavated and lined with rocks and gravels, carefully placed to provide a range of flow conditions passable by smaller fish as well as the more athletic salmonid species. The channel upstream is now freely flowing and as the gravel bed clears of silt, it is hoped that fish newly finding their way to this area will stay and spawn.



The channel being constructed bypasses Malm Lock, enabling fish to reach the habitat upstream. Image: Dennis Bright

Hockley: movements by monorail

A late addition to the project, works at Hockley were incorporated when significant deterioration of the banks and footpath led to public pressure to undertake repairs. As well as making public access potentially dangerous, erosion meant that the channel was under threat of collapse.

Work took place in 2010/11 to secure the future of a kilometre of riverine habitat, making this the largest piece of work undertaken by the project.

As with other sites, access to undertake the works was problematic. Crossing the adjoining wet meadows would have been both costly and damaging to the habitat. Instead, a monorail was set up to transport the tools and materials needed to stabilise the banks, resurface the footpath, and enhance the river's margins.

The small engine was efficient, the tracks could be laid like sections of a train set to direct the monorail to wherever was needed, and the many stanchions spread the load, protecting the habitats beneath.

Silt from ditch clearance work, already rich in seed and root material, was used to fill the large berm created alongside the repaired bank, and provided an excellent medium for planting in to. Berms created through the project not only prevent bank erosion, but also narrow the channel, maintaining flow rates in the centre. This keeps the gravel bed scoured clean, allowing fish to lay their eggs there.



Hockley Monorail



Images: Dennis Bright, Ali Morse

Shawford: protecting the banks with 'post & plank'

The banks at Shawford had also suffered damage from tree roots, and had been eroded by high flows during winter. In 2009, tree works removed damaging root growth, and unstable trees at risk of ripping apart the banks if they fell. The resulting increase in light levels encouraged the growth of plants along the river's margins, which will help to protect the banks from future erosion.

In contrast to Allbrook however, the Navigation at Shawford was less vulnerable to collapse as it is not as elevated. Different solutions to its long-term stability were therefore employed. In the more vulnerable areas, chalk and path gravels used to build up eroded areas of bank and footpath were held in place by oak post-and-plank revetment. In other areas, where less rebuilding was required, the materials did not need to be retained.



Plants sourced from the Itchen and grown on in a nursery are installed by contractors, providing 'instant habitat'.

In front of both types of repair, a gently-sloping 'berm' of bankside vegetation was created along the river's margins. Hazel faggots were used to edge the berm, and the area behind was planted with a combination of directly sourced plants and pre-planted coir mats, rolled out and installed just like carpet.



A 'Dog Dip' being constructed, to allow access to the water whilst preventing bank erosion

Two 'Dog Dips' were also installed in areas where access to the channel was common, providing a novel way of protecting adjacent wildlife habitat from trampling.

Images: Dennis Bright

Brambridge: Transporting materials by boat

Works undertaken at Brambridge in 2010 were similar to those at Shawford, with banks rebuilt & footpaths resurfaced, and vulnerable sections protected by post and plank revetment. Again a marginal berm was created using locally sourced wetland plants, providing ideal habitat for invertebrates and semi-aquatic mammals.

The main difference between works here and at Shawford was access to the site. The bank and footpath at Brambridge are sandwiched between the channels of the Navigation and the main river, so materials couldn't be brought in along the narrow footpath.

Instead, materials were delivered by road to an adjacent woodland copse, packed into individual 300kg bags. A mini-digger carried the bags one by one over a temporary trackway through the woodland, and loaded them into a flat bottomed boat at the water's edge. The boat transported the materials downstream, again one at a time, to a mobile gantry, where they were unloaded and utilised by a second mini-digger. The digger placed materials in front of it, working its way upstream towards the site entrance, moving only onto sections of bank that it had just repaired.

The marginal plants installed were soon supporting a host of invertebrates, and the rare southern damselfly was recorded using the berm within a few weeks of its creation.



Boat transport was safer and lower-impact than using heavy machinery Images: Dennis Bright

Eastleigh & Southampton: Access & habitat enhancements

The Navigation alongside Itchen Valley Country Park no longer flows, and the footpath winds its way in and out of the old channel. Although no longer home to salmon or water vole, the ephemeral wetlands created by the rains of each winter provide valuable habitat. Walkers value the strip of scrubby fen and wet woodland, providing a contrast to the flowing parts of the Navigation, as well as the remains of historic locks, and the attractive views out across the wet meadows.

A programme of tree and scrub control commenced, and in summer 2010, works were undertaken to raise, realign and resurface the eroded footpaths, and to replace stiles with kissing gates to improve accessibility.

Downstream at Mansbridge, footpaths across Mansbridge meadow and around Mansbridge Reservoir were resurfaced, 'RADAR' kissing gates were installed, and the footbridge across Mansbridge Lock was refurbished.

Early in 2011, habitat enhancements were undertaken at the adjacent Mansbridge Fen, through tree removal and ditch restoration. Volunteers are continuing to help manage the fen through the control of scrub and of non-native species.



At Mansbridge Fen, an excavator clears a silted-up ditch to encourage the spread of fen vegetation



Footpath raising, realignment and resurfacing improve accessibility and limit erosion of surrounding habitats. Images: Dennis Bright