

6 Environment

6.1 This section deals with issues related to the environment of the River Wensum through Norwich. In this strategy the term ‘environment’ covers a broad range of topics including biodiversity, the physical and chemical condition of the river water, visual appearance and open space.

6.2 The character of the river corridor is highly varied with Whitlingham Country Park to the East, a historic urban core, and a suburban setting to the west. There is a wide variety of uses and natural processes that take place on and around the river, with many opportunities for enhancement as well as some conflicting interests with leisure, development and business uses. Balancing these issues for wildlife and people is a complex challenge and the end result must also protect those natural processes that maintain the health of the river.

Water quality

Policy 11: A good quality of water will be maintained and where possible enhanced in the River Wensum.

6.3 The water quality of the River Wensum through Norwich has been identified by both the partner organisations and responses from the public consultation as a key issue. Water quality is monitored by the Environment Agency. The River Wensum’s water quality is generally good¹⁴, and has significantly improved in recent years partly due to cessation of industrial activities in its vicinity and improved sewage treatment, and also to specific initiatives by the EA and other agencies. We want to see clean water flowing through Norwich as this supports a diverse and healthy ecology, including fish. We want to ensure that drainage waters entering the river within and upstream of Norwich are as clean and free of pollutants as possible. We also want to



¹⁴ Good water quality is that which meets the needs of the plants and animals that should thrive in a lowland river that flows through our city. It will be free of significant uncontrolled pollution events and meet the expected environmental quality targets for a river of this type (which are monitored and reported by the Environment Agency).

improve the habitat within the river itself to better support a thriving ecology where this does not conflict with current uses of the river.

6.4 The greatest risks to the quality of the river water through Norwich come from:

- Foul water/ surface water sewers misconnections, which can then outfall to the river;
- Pollution, including substances wrongly emptied into drains, from businesses and homes as well as road and impermeable paving run-off draining to surface water sewers;
- Pollution from craft on the water;
- Sediment run-off upstream of Norwich; and
- Uncontrolled litter and bankside vegetation on the water surface.

6.5 The Environment Agency, Anglian Water and Norwich City Council have a range of approaches to ensure polluted water cannot enter the river and will enforce unlawful breaches where necessary (see appendix 1), and planning policies address surface water run-off and flooding issues (see appendix 2).

6.6 It is also important to consider what happens upstream of Norwich, since this has an impact on the quality of the river through the city. There are a number of initiatives currently underway to ensure this quality is safeguarded. These include a programme investment by Anglian Water in phosphorus removal from a number of their water recycling centres on the Wensum. Anglian Water is also working to ensure sustainable water abstraction for Norwich by upgrading the Heigham Water Treatment Works allowing environmental improvement further upstream at Costessey. Natural England is undertaking work through the Catchment Sensitive Farming initiative to support farmers to reduce the chance of diffuse pollution from their activities. The upper Wensum is host to one of three DEFRA demonstration test catchments conducting farm trials to assess whether it is possible to cost-effectively reduce the impact of agricultural diffuse water pollution on ecology while maintaining food security. All these measures aim to ensure the quality of river water flowing through Norwich is as good as possible.

6.7 The River Wensum Restoration Strategy has been developed by Natural England, in partnership with the Environment Agency and the Water Management Alliance, to restore the physical functioning of the river in order that it can sustain the wildlife and fisheries characteristic of a Norfolk chalk river. Working in partnership with landowners, the Norfolk Rivers Internal Drainage Board, fishing clubs and other interested groups, 12 kilometres of the River Wensum have so far been restored, including major restoration schemes at Bintree, Great Ryburgh Common, Ryburgh End, Swanton Morley, Tatterford and Sculthorpe.

6.8 The River Wensum upstream of Norwich is designated a Special Area of Conservation (SAC), in recognition of its environmental value, and feeds into the many designated sites of the Norfolk Broads downstream of Norwich. Whilst the river through Norwich is not designated, it is a vital link within the larger river system and remains sensitive to environment pollution.

6.9 Surface water runoff drains to the river at numerous points through Norwich. The city centre still has a combined sewer system in many places, including parts of a Victorian system from the 19th century, which cannot separate surface water from foul water flows. During emergency situations when the system's capacity is reached, for example during heavy rainfall or when foul water pipes become blocked, these combined surface overflows are designed to discharge foul and surface waters into the river to prevent flooding of homes, businesses and streets.

6.10 Certain areas of Norwich have a high number of restaurants and take-away businesses that have an associated risk of discharging fats, oils and grease (FOG) into sewer systems. Once congealed, these substances can block pipes causing discharges to the river. This has been evident in past years with incidents of foul water in the River Wensum, although Anglian Water has a jetting regime and routinely jets the system around Magdalen Street. FOG and foul water discharges have an obvious visual impact on river water, but also introduce nutrients and solids which have an environmental impact on the river's ecology. There are also potential health impacts for recreational users of the river in Norwich with the potential to affect tourism revenue.

6.11 The Action Plan includes a proposal (E1) to improve water quality in the River Wensum by reducing the levels of fats oils and grease (FOG) entering the river in the Magdalen Street / Fye Bridge area. This will be achieved by a focused campaign targeted at all food establishments along Magdalen Street and Tombland to increase awareness of the issues of FOG on their local environment, which should lead to a reduction in the required frequency of sewer maintenance and improved water quality. The project will be delivered by Anglian Water, anticipated in 2017/18.

Map 17: Fats Oils and Grease project (Action Plan project E1)



6.12 There are other ways to enhance and maintain water quality, including monitoring, and keeping the river clean and free from litter. These are management issues and it is proposed that they can best be addressed through the proposed Delivery Board, referred to in Section 8. This could also involve working in partnership with relevant organisations and agencies to investigate the potential for future enhancements to water quality.

Biodiversity and habitat

Policy 12: The biodiversity value of the River Wensum corridor will be protected and enhanced, and opportunities will be taken to improve its habitat.

6.13 The changes that have been made to the river's quality and physical shape over the centuries have greatly affected the habitats and species found today. The river does not benefit from any specific designations through the city but it still supports a wide variety of species and habitat, as well as areas for nesting and spawning.

6.14 Enhancing the biodiversity of the river is valuable to people in many ways; it generally has a positive effect on property values, it supports many strategies for health and wellbeing and provides a draw for tourism, in the same way cultural and historical assets can. There is also the potential to enhance the habitat of the river corridor through a number of specific measures.



6.15 A Biodiversity Action Plan was produced by Norwich City Council in 2002 which identified a series of actions to protect and enhance biodiversity in the city. There is a need to address biodiversity issues in the river corridor which could be achieved through a targeted biodiversity enhancement plan. This is addressed through project E2 in the action plan which proposes a Biodiversity Enhancement and Non-native Species Management Plan. This would draw upon the 2002 document but it is proposed to have a broader remit, to include the management of non-native species which has become a significant issue in recent years.

6.16 Due to the urban nature of the River Wensum through Norwich, the multiple interests within this part of the river and this being a time of economic restraint, it is not considered appropriate to develop a full biodiversity programme for a non-designated part of the river. Instead, the focus for this project is to develop a plan that will maximise biodiversity along the whole river corridor through intervention at critical points, and manage and/ or eradicate non-beneficial, non-native species.

6.17 The biodiversity plan should complement, not repeat, existing plans that provide guidance on biodiversity in Norwich and should set deliverable targets for biodiversity enhancement and non-native species reduction that can be monitored over time. The plan will focus on specific intervention sites to deliver high value-added outcomes along the whole river corridor through Norwich, identify key species and habitats to deliver biodiversity gain, develop a non-native species management plan for management and/ or eradication of identified species, and include a monitoring plan to ensure the effectiveness and feedback improvements for future delivery by partners. It is anticipated that the Biodiversity Enhancement and Non-Native Species Management Plan will be led by Wild Anglia working in partnership with other organisations as appropriate, including conservation bodies.

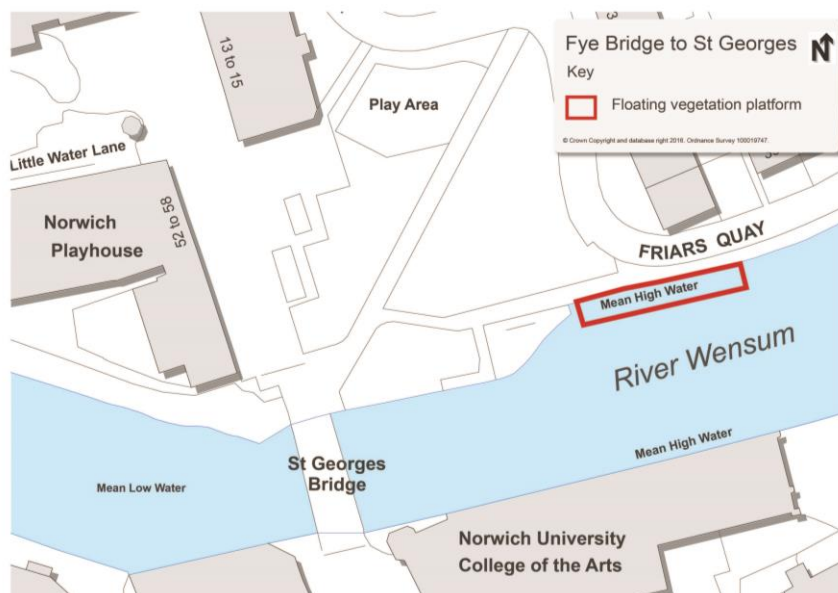
6.18 The action plan proposes two specific projects to address habitat enhancement issues, set out below. Other potential habitat improvements have also been identified through the public consultation and through discussion with partners, which will require feasibility work and identification of funding (see appendix 3 for further details of potential projects).

Floating vegetation platforms

6.19 The River Wensum through Norwich is heavily modified for the identified purposes of flood protection, navigation and recreation. These essential uses mean that the form and function of the river are constrained by artificial features, in particular sheet piling. Such features give the river, particularly through the central core and Riverside areas, a unique appearance but also constrain ecological potential and visual interest. Certain sections of river have little or no bank-side vegetation due to the vertical piled walls, which cannot support healthy populations of fish and other biology. They are also less aesthetically pleasing to water/ riverside users and property developers. The poor condition of plant communities and predominance of hard engineered banks has been identified as a particular obstacle in meeting the Water Framework Directive (WFD) for the Wensum.

6.20 Project E3 is a pilot project to install a floating vegetation platform in the section of river between Fye Bridge and St George's Bridge. This will be funded by the Environment Agency with implementation likely in the current financial year (2017/18).

Map 18: floating vegetation platform between Fye Bridge and St George's Bridge (action plan policy E3)



6.21 It is proposed in the longer term to identify other locations for floating vegetation platforms: existing pontoons and piled river banks are likely to be the main focus. These platforms would be installed as part of a rolling programme to improve existing stretches of low environmental value infrastructure. The feasibility of these locations will be investigated, and options for funding and maintenance explored, including business sponsorship and new development where appropriate. Floating vegetation platforms are supported by Norwich City Council's recently adopted Landscape and Trees Supplementary Planning Document (June 2016), which was informed by the emerging River Wensum Strategy. It states (at paragraph 2.5.4):

"...Sites that have boundaries with rivers or other water courses also present opportunities for habitat enhancement. This could include for example provision of floating vegetation platforms, where appropriate, which will increase and diversity vegetation along the river, and include native and high yield pollination species."

Eel pass

6.22 During the development of the draft River Wensum Strategy a project was proposed to enhance the habitat for the river's eel population and to address the decline in eel stocks which is a matter of international concern. Eels are a protected species; the "Eels (England and Wales) Regulations 2009" gives the EA powers to protect eels and require improvements in passage to assist their migration over barriers and weirs.

6.23 New Mills Yard is the tidal limit of the Wensum and was identified as a critical barrier to fish movement, being totally impassable for any fish species present in the catchment, including migratory salmonids (sea trout) and eel.

6.24 The project proposed installation of a single eel pass over the gate on the 'true left' (east) bank of the river, to replace a small primitive elver trap which was insufficient in scale for the number of elver suspected to be present, and the installation of an automatic monitoring system to count eels as they pass through the structure.

6.25 Installation of the eel pass was funded by the Environment Agency and carried out in spring 2017. The EA is responsible for ongoing maintenance of the eel pass and will continue to monitor the numbers of elver passing through the structure. The eel pass enables eel to access 4.6 km to Hellesdon sluice and then on into the Wensum and Tud, with benefits for biodiversity and ecology



Map 19: New Mills Eel Pass

Flood risk reduction

Policy 13: Opportunities will be taken, where practicable and feasible, to re-naturalise the profile of the River Wensum and to create additional floodwater storage along river banks.

6.26 The River Wensum through Norwich is an urban river that has been modified many times during the history of the city. In some places, particularly downstream of New Mills, it has been widened and straightened to aid the passage of boats, support industry and help control flooding. In the 21st Century most industrial uses of the river, together with its role as a port, have diminished or stopped entirely. As a result there is an opportunity to consider again how the shape of the river (its profile) and its banks can best support the city, its people and the natural environment. In

particular there is an opportunity to use the development and infrastructure that is planned for Norwich to reduce the risk of flooding and to maximise habitat for key plants and animals.

6.27 Potential opportunities include ensuring that the design of new development and infrastructure along the river encourages creation of new features by changing the shape of the banks (its profile) where appropriate, and encourages good practice by existing riverside property owners. New Mills has been identified as a location where changing the river's profile could provide benefits in terms of reducing flood risk reduction and improving habitat and biodiversity, however there are no plans to undertake changes to the structure at this time.

6.28 Specific flood risk reduction measures would vary in scale and purpose and could be delivered through new strategic-scale initiatives or individual project proposals, such as building on the recent £10m programme led by Norfolk County Council to resolve surface water drainage identified within the Norwich Surface Water Management Plan to provide new multifunctional spaces to existing areas of poor or over-capacity drainage; or they might be smaller and delivered by individual projects such as continuing to ensure that appropriate Sustainable Drainage Systems (SuDS) are provided by developers through new development (as required by Norwich Local Plan policy DM5 for example). Using the latest flood risk modelling from the Environment Agency and Anglian Water to explore how the river profile can help further mitigate the risk from flooding provides an opportunity to consider how new and existing open areas along the river corridor are used to maximise the storage they provide during times of flooding. Creation of additional storage along river banks when they are to be repaired or developed, especially if they are currently piled, will be encouraged.

Renewable Energy

Policy 14: The use of renewable forms of energy generation, in particular water source heat pumps, will be encouraged for new development in the river corridor, where practicable and feasible.

6.29 The strategy seeks to encourage renewable energy generation in the river corridor, including water source heat pumps (WSHPs). This is in line with the planning policies of both Norwich City Council (policy DM4) and the Broads Authority (DP8), although WSHPs are not specifically referred to in either policy. The city council recently commissioned a study examining the technical and financial feasibility of WSHPs for the River Wensum. The study concludes that this technology is likely to be feasible compared to some of the more conventional forms of energy generation, and that it has potential for application in the river corridor.

Open Spaces and Development that supports the River

Policy 15: Opportunities will be sought to enhance and increase green infrastructure and areas of open space within the river corridor.

6.30 The River Wensum provides the largest area of continuous open space within the city. Responses to the public consultation indicate that retaining, enhancing and celebrating the natural and cultural value of the river is important to people.

6.31 A key aspect of this strategy is to provide greater connectivity with the river, which is likely to result in greater direct use. At the same time the strategy also sets out to protect important environmental and heritage assets. This will be achieved by ensuring a balance between natural spaces and greater river infrastructure, whilst ensuring that riverside development is designed to be sympathetic to its surroundings.

6.32 A longer term opportunity has been identified through the strategy to enhance the existing open space between Bishops Bridge and Whitefriars. This aims to maximise biodiversity potential, improve recreational access and develop the tourism offer for this part of the River Wensum and is discussed further in section 7. Upstream of New Mills, there is also potential to enhance access to the river from Wensum Park which again is referred to in section 7.

Cow Tower



6.33 There are other areas in the city centre, for example along Riverside, where there may be opportunities to seek to enhance open space provision adjacent to the river which will help to meet the recreational needs of the existing and growing population in the city centre and east Norwich. Opportunities should be taken where possible to maximise such open spaces and ensure that they are designed to complement and enhance the river frontage.

6.34 The river already possesses several areas that afford quiet and more naturalised spaces, such as along the Marriott's Way approaching Hellesdon Mill, Anderson's Meadow and around the Cow Tower. Whitlingham Country Park and the historic Wensum Park also provide open space along the river corridor. As many of these areas are designated as County Wildlife Sites, Local Nature Reserves or public parks they represent the best opportunities to develop a recognised series of long term open spaces that support wildlife and peoples use of the river.

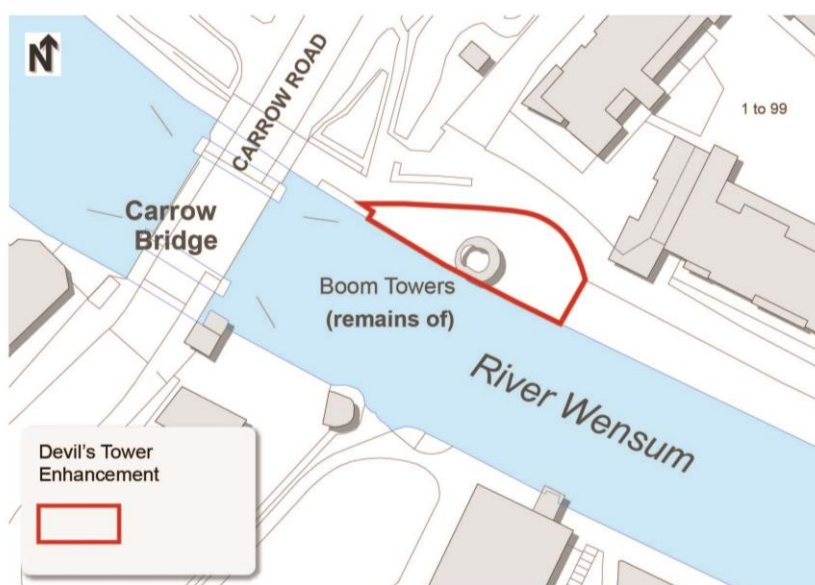
Boom Towers enhancement

6.35 The action plan includes a project (E4) to enhance the setting of the one of the Boom Towers, adjacent to Carrow Bridge. The Boom Towers are unique heritage assets adjacent to the River Wensum and riverside walk and form part of the historic city walls. This area was historically a gateway to the city of Norwich. Despite this, there is no heritage interpretation of these structures and no sense of their historic significance and gateway function. The Devil's Tower on the south bank of the river is a scheduled ancient monument. It is located close to recently developed flats adjacent to the river and has the potential for an enhanced public open space, which will benefit the rapidly expanding residential population in this area as well as tourists and visitors.

6.36 The proposed project comprises enhancement to the setting of the Devil's Tower through landscaping (including cutting back of trees obscuring the structure), biodiversity enhancements, seating, interpretation, signage, and by some minor repairs to the structure itself. This will result in an enhanced open space beside new development and the river, contributing to the better enjoyment of this heritage asset and the river corridor. This is also an important gateway to the city which will be emphasised by this enhancement scheme.

6.37 This project would also complement a longer term proposal (Boom Towers to Ber Street woodland park – see section 7) by effectively forming the starting point for a possible new urban woodland park, linking the river Wensum to the city centre along the city walls and Ber Street wooded ridge.

Map 20: Boom Towers enhancement project (Action Plan project E4)



6.38 There are a number of potential development sites in the vicinity of the River Wensum. Sites allocated in the Norwich Site Allocations Plan are set out in Appendix 2, some of which have already been referred earlier in this strategy document, for example the Deal and Utilities sites in east Norwich.

6.39 These site allocation policies seek to secure potential benefits to the river corridor, for example provision of Riverside Walk. However other sites which are not included in the local plan may come forward for development within the strategy period. These may include several sites that were allocated in the Northern City Centre Area Action Plan which expired in March 2016, for example Mary Chapman Court on Duke Street (referred to in section 7 – Longer term opportunities), and land at 123-161 Oak Street which is proposed for housing development with potential to include an extension to the riverside walk.

6.40 It is important that the opportunity is taken to ensure that new development in the vicinity of the river is sensitive to its riverside setting and will enhance the setting of the river where possible. Development should not only be in accordance with the policies and proposals in the relevant planning policy documents as referred to in Appendix 2, but should also be in accordance with the detailed design advice in the City Centre Conservation Area Appraisal (relevant sub-areas include: Northern Riverside, Cathedral Close, Prince of Wales Road, and King Street). St Matthews Conservation Area Appraisal and Bracondale Conservation Area appraisal may also be relevant.

Quayside

