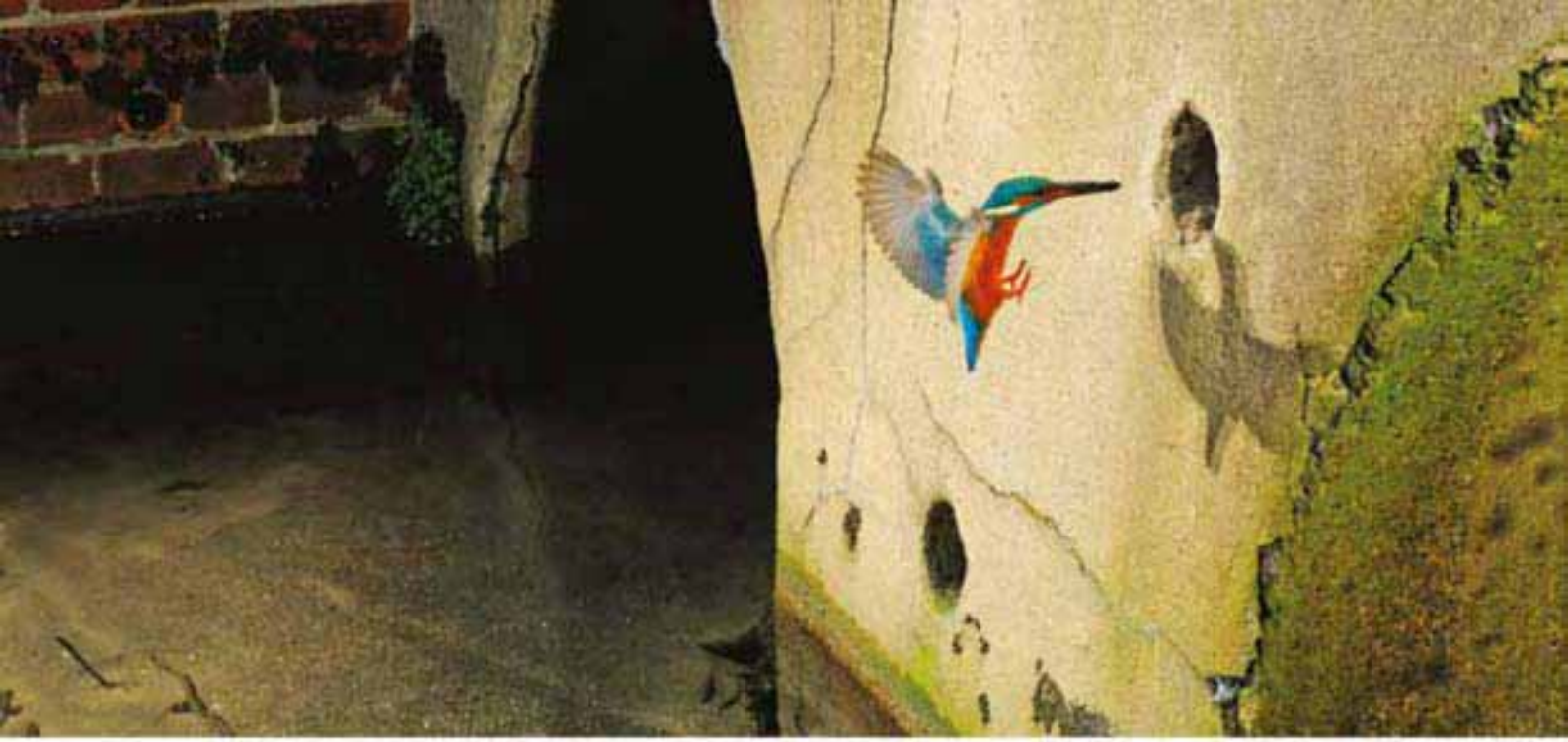
RAVENSBOURNE CATCHMENT PLAN

YOUR CATCHMENT - YOUR ASPIRATIONS 2015-2021

Improving rivers, landscape and public access with local communities



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Catchment Plan Production Thanks

Catchment Plan supported by ERCIP

FOREWORD

The Ravensbourne Catchment is the area that feeds water into the three connected rivers of the Ravensbourne, Pool and Quaggy. These Rivers flow across the South London boroughs of Lewisham, Greenwich, Bromley and Croydon reaching the confluence with the River Thames at Deptford.

Rainwater drains rapidly into these river channels from the extensive hard surfaces of this highly urban catchment area making flows volatile. The rivers have been extensively straightened, widened and encased in concrete to reduce the risk of flooding and accommodate development. Water quality suffers from pollution carried by surface run off from our roads and household misconnections from toilets, bathrooms and kitchens.

Despite these issues, the catchment and its wildlife are highly valued by local people. The rivers run through or beside many public parks and open areas creating important natural spaces in the crowded city, schemes such as the Waterlink Way ensure continued public access and enjoyment. There are exceptional examples of river channel restoration at Chinbook Meadow, Sutciffe Park, Ladywell Fields and Cornmill Gardens to name a few outstanding examples. There is also a long history of local people taking an active role in caring for and improving the local rivers. In 2015, the seventh annual 3 Rivers Clean Up ran for three weeks in June and July. Over 300 volunteers at 35 events removed rubbish and invasive plants from the river.

The formation of the Ravensbourne Catchment Improvement Group created a new inclusive approach to tackling the issues of the catchment. The Group is involving local people, organisations and businesses in developing and carrying out actions. The Group works together to learn from previous successes, share ideas and resources and agree a programme of actions to improve the catchment. This Catchment Plan sets out the aspirations for the catchment and proposes actions that will create lasting improvements to the local environment and for the local community.

Chris Coode
Thames21

INTRODUCTION AND KEY MESSAGES

The Ravensbourne Catchment Plan aims to assist those that manage our waterways and also the people who enjoy walking, working, talking and playing by our treasured rivers.

Nature

Over the past 20 years there has been a transformation in the relationship between nature, development and governance. Many of the catchmentent's celebrated river restoration projects have been brought about by putting the needs of nature first or by recognising the value of natural environments to the local community.

Environment

A balance is now sought between the interests of environmental protection and enhancement, flood risk, housing supply and economic growth. This catchment plan crosses both political and geographical boundaries and, in doing so, brings the social and political together, at the river's edge.

Water

A river catchment is defined as the area of land from which all surface water run-off flows to a single point, in the case of the Ravensbourne catchment this is the Thames at Deptford. The river corridors contained within a catchment are characterised by the interactions of natural influences, such as water flow, geology, soil, climate, flora and fauna with cultural inputs such as the historical and current impact of land use, settlement, public access and other human interventions and interests. This catchment plan considers all of these characteristics in both telling the story of our river valleys and laying out a plan for the catchment's future.

About the Ravensbourne Catchment Plan

The creation and implementation of the Ravensbourne Catchment Plan is a partnership project. Before writing the Plan we made sure that we had talked to people who enjoy the rivers regularly, those who would like to in the future and those who are directly involved in its improvement. There are a wide range of interest groups, friends groups, environmental charities and London Boroughs who participate in the improvement of our rivers. A steering committee, the Ravensbourne Catchment Improvement Group (RCIG) was formed to collate opportunities, identify a way forward and evaluate the success improvement projects. The catchment planning process, overseen by the RCIG, provides a forum for the future by integrating ideas from broad public consultation into discussions with Borough representatives and the Environment Agency. A Vision document was created by the partnership to summarise the aspirations of both the RCIG and the local community, and this has informed the creation of the Catchment Plan.

Our rivers face many challenges now, and in the future, and it is hoped that this plan will provide a clear path towards a more natural, inclusive and resilient catchment.

About the Ravensbourne Catchment Improvement Group

The Ravensbourne Catchment Improvement Group (RCIG) was formed in 2012 with support from Local Authorities and the Environment Agency. Initially hosted by Thames21, the group is made up of representatives of the four boroughs of the catchment: Lewisham, Greenwich, Bromley and Croydon along with environmental charities and Environment Agency officers.

Our aim is to improve the rivers and to provide wider benefits for people and nature on a catchment scale. Our partners have agreed a Vision for the catchment and we believe that the Ravensbourne Catchment Plan will take the key messages of the Vision to create an explanatory and working document that can be used to build on the catchment's success stories.

The work of the RCIG supports the adoption of the Catchment Based Approach (CaBA) by government as the best framework for delivering river improvements nationwide and will help the Ravensbourne Catchment to reach a state of health known as 'Good Ecological Potential' for the purposes of fulfilling the UK's obligations under the European Water Framework Directive.

The Ravensbourne Catchment Plan will form part of a UK-wide collection of strategy documents, each tailored to the individual requirements of their local river catchments.


Monika, 3 Rivers Clean Up volunteer

"Helping to clean the river was a fantastic experience for all of our family. We removed a lot of Himalayan balsam from the River Quaggy at Manor House Gardens and further upstream. For our children it was a lot of fun but also an example of good environmental practice."

A SHARED VISION FOR THE RAVENSBOURNE CATCHMENT BY 2021

We want a catchment where:

- New development enhances the river and allows nature to thrive.
- Opportunities for leisure, education and discovery are commonplace.
- Community and volunteer groups are well supported in their work along the river.
- Enhancement and education programmes benefit local people.
- A locally supported Catchment Plan creates a path toward a healthy future for the rivers within the catchment.

A natural place where:

- Species and habitats thrive along clean-water river corridors.
- A diverse natural environment attracts people to the rivers.
- A mosaic of habitats and green corridors allow species to move freely throughout the catchment.
- Public access to nature is widespread rather than an exception.
- Nature is both respected and protected.

A future where:

- The threat of flooding is vastly reduced for local communities.
- A strong partnership between Local Authorities, Local Flood Authorities and developers ensures that communities are protected against the impacts of climate change.
- Communities are encouraged to become stewards of their local river through citizen science programmes and are fully supported with education, equipment and funding.
- The catchment partnership listens to the public and identifies key enhancement and improvement opportunities for our rivers.

1 CATCHMENT FACTS AND FIGURES

The Ravensbourne catchment in south east London contains 41miles/66kms of rivers and streams with a total catchment area of 111miles2/180 km2. The rivers Ravensbourne, Pool, Quaggy and Kid Brook flow through the London Boroughs of Bromley, Lewisham, Croydon and the Royal Borough of Greenwich. From sources at Keston, Locksbottom and Croydon the rivers discharge into the Thames at Deptford. The catchment contains a broad diversity of land-use from farming, woodland, parkland, regenerated urban greenspace, urban residential, commercial and industrial and, as such, creates many challenges for the future in terms of protection for our natural environment and sustainable economic growth for the rivers' urban surround.

Geology

The catchment's natural landscape comprises a valley system that drains into the Thames at Deptford Creek. The catchment is 17km in length, covers 180kms2 of space with 66km of rivers and streams throughout.

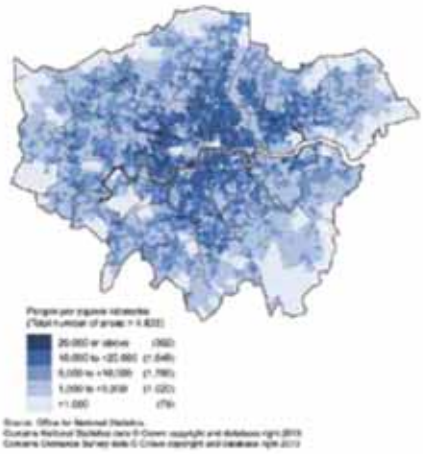
Within its valleys the four rivers flow broadly south to north. The upper stretches of these rivers are fed by numerous small streams, ditches and springs, such as Caesar's Well, Keston and Nobody's Wood, Locksbottom.

The topography and geology of the valley continues to the south, into the Chalk slopes of the North Downs, but it is now dry under most circumstances. In exceptionally wet years some springs may still appear further up the valley.

The valleys cut into the underlying London Clays, and the older rocks of the Harwich Formation, Lambeth Group, Thanet Sand and Lewes Nodular chalk formations, which underlie the London Clay. The land climbs most sharply on the western side, where the Crystal Palace Ridge forms a distinct topographical feature. To the east, the slopes are gentler, although there is a steep climb from the Kid Brook (60m AOD) to Chislehurst (100m AOD).

In the wider parts of the valleys, particularly around the confluence of the Pool and Ravensbourne rivers at Bellingham, deposits of river terrace gravels are found. A thin strip of alluvium marks the actual course of each river while head deposits flank the valley sides in places, particularly in the Pool valley. The Ravensbourne joins the Thames at Deptford Creek, which still remains one of the few navigable creeks along the Thames.

Social



Approximately 1.25 million people live within the Ravensbourne Catchment. The four boroughs within the catchment face challenges in areas such as housing stock, public health, overcrowding, inequality, low income, benefit reforms, unemployment. All boroughs have a slightly lower than national average life expectancy of approximately 79yrs. In contrast, 83% of Lewisham's population, for example, has declared itself as 'healthy' which may be something to do with the borough having the one of the largest percentages of greenspace in London. All boroughs have made a commitment to improve health and well-being amongst their communities. [1]

Wildlife

The catchment has seen great improvement in its biodiversity over the last 20 years following the regeneration of many riparian sites with a broad increase in birdlife and plant species. Regular reports from NGOs, user groups and the boroughs themselves are given to the GiGL and the Lewisham Biodiversity Partnership while habitat management programmes are ongoing throughout the catchment to introduce fish and eel passages, bird and bat boxes, for example, but as an urban catchment there are development-related challenges to face. Across the catchment there are numerous Local Nature Reserves, Green Flag sites and Sites of Nature Conservation Interest (SINC), (more information at https://www.gov.uk/protected-or-designated-areas) There is a broad commitment to increasing biodiversity within the catchment as it not only provides a useful indicator of progress towards national targets but also provides great enjoyment to those accessing the green spaces through which our rivers pass.

Further reading Biodiversity 2020: A strategy for England's wildlife and ecosystem services. [(2)]

Culture

The river, and its wildlife, provides great inspiration to writers, artists and photographers with many exhibitions, talks and river-related events taking place. In 2012 the London Bubble Theatre performed on the banks of the Ravensbourne in Ladywell Fields, having taken ideas from many local sources including local residents, groups, Lewisham hospital staff and the Rivers and People project, while storyteller Richard Neville enthralled the audience along the riverbanks in 2015. The world-renowned Trinity Laban's Faculty of Dance is also situated on the banks of the Ravensbourne at Creekside in Deptford with the river often a source of inspiration.

1 ACTION

South East London is one of the most multicultural areas of the UK, this plan is a welcoming hand and an invitation to share our aspirations for the future of the rivers and waterways of the four Local Authorities.

2 WHAT ARE THE CHALLENGES?

Flooding

The Ravensbourne catchment has historically experienced occasional, localised flooding at points on all of the rivers. During the winter of 2013/14, flooding was experienced along the Quaggy to the east and Kid Brook to the south. The most severe flooding in living memory occurred in 1968 in Lewisham and Catford centres after the Ravensbourne burst its banks.

Through the 1960s significant engineering work was undertaken to all of the catchment's rivers to reduce the risk of flooding. This included putting long stretches of the river into concrete channels to convey floodwater more quickly to the River Thames. The various alleviation measures have helped protect much of the catchment from experiencing more frequent smaller flood incidents, especially in the lower half of the catchment, though these alleviated areas remain at risk in less frequent, more extreme, weather incidents.

Even with these existing flood alleviation works in place the Environment Agency identify that there are currently approximately 4400 homes and 600 other types of properties (such as offices, warehouses, shops and community facilities) located on land that has a 1% (1 in 100) chance each year of being flooded from the River Ravensbourne.

Creative solutions will be necessary to overcome these challenges in, what is, a mixed catchment of natural, semi-natural and engineered river channels. Already regenerated sites at Sutcliffe Park, Chinbrook Meadows and Cornmill Gardens help in the absorption, or attenuation, of floodwaters while new proposed schemes such as the Lewisham and Catford Flood Alleviation Scheme [3] could greatly reduce the threat to the catchment's residents and businesses. The Environment Agency estimate that approximately 400 homes and 280 businesses will benefit from a reduced risk of flooding. Many more businesses will be able to remain open during more extreme weather conditions while disruption to local infrastructure will be greatly reduced. Impacts also to insurance premiums, property prices and resale values are immeasurable.

Drainage into our rivers from roads and urban developments also contribute to both flood risk and pollution therefore it is considered that sustainable drainage systems, or SuDS, should be implemented and incorporated into planning design to reduce these impacts and create an intervention of flood waters at street level.

Water Quality

Urban diffuse pollution from domestic and industrial waste misconnections, run-off from roads and casual dumping of liquid in street drains poses a significant threat to achieving healthier and cleaner river water.

The highly urbanised nature of the Ravensbourne exacerbates the pollution pressures we face. The waterbodies are currently failing for phosphate and pH, the latter due to high levels of nutrients in the water. Nutrient enrichment is called eutrophication and this leads to the formation of algae, which can affect oxygen levels in the river and reduce biodiversity. Eutrophication can be caused by the presence of domestic wastewater. These issues, the presence of invasive species and physical modification pressures, give rise to poor water quality and habitat diversity for a number of rivers, as well as varied biological quality throughout the catchment. Our catchment partners are committed to achieving a 'good quality' status for our rivers under the Water Framework Directive and intend to reach these goals by 2027.

Upper Ravensbourne (Keston - Catford)

The upper Ravensbourne waterbody is fed from the Bromley Tertiaries groundwater body. This groundwater is currently classified as having Good Chemical Status under the Water Framework Directive (WFD), so provides the river with clean water at its source.

The WFD classification point for water chemistry in the Upper Ravensbourne waterbody is situated in a fairly rural catchment to the south of Bromley, just 3.5km from the river's source. The water quality here meets Good Chemical Status under WFD. Further north the catchment becomes increasingly urbanised, flowing through Bromley and Beckenham where it suffers from numerous intermittent pollutions from misconnections and contamination associated with urban run-off.

Lower Ravensbourne (Catford - Deptford), Pool and Quaggy:

Water quality in the Lower Ravensbourne, Pool and Quaggy waterbodies are currently only failing for phosphate. This is an extremely urbanised catchment and impacted by misconnected properties and spills from Combined Sewer Outfalls (CSOs). Elevated nutrient levels results in eutrophication leading to excessive algal growths and daily fluctuations in water quality indicators such as Dissolved Oxygen saturation (DO%) and pH. These fluctuations may be missed by spot sampling but can have a significant long-term impact on the ecological diversity of the river. Continued partnership working between the Environment Agency, Thames Water and local authorities to identify and rectify misconnections will be essential to improve water quality in these waterbodies

Invasive non-native species are plants and animals that cause serious negative impact on our native species, our health or our economy. As non native species are brought into our local ecosystems, that have developed without them, and without the conditions (nutrients, moisture, pests, diseases, etc.) that limit their growth in their natural system and place of origin. This allows some species to grow and reproduce unchecked. The ecosystem is unable to cope with this new species and is thrown off balance. [(4)]

For many years our waterways have been colonized by problem non-native invasive species such as Himalayan Balsam, Giant Hogweed and Japanese Knotweed. These plants prevent a broader diversity of native flora from populating some of the natural, and regenerated river sites. Many of such species were introduced during the Victorian era as ornamental garden plants. Over time they escaped their confines and colonised our rural and urban waterways, having a detrimental effect on not only the river banks but also on the native flora population. Recently, and during the heavy rains of the 2013/14 winter, many buried seeds were released from these banks and the summer of 2014 saw an abundance of these species return to the catchment. Japanese Knotweed presents a particular problem as it is damaging to property and difficult to get rid of. During the creation of the Olympic Park, for example, it took several years and an estimated £70million to remove this species, according to the Royal Horticultural Society [(5)]. Many of the comments made during the consultation process were regarding Japanese Knotweed and concerns for its spread locally.



Invasive plant and animal species

The following invasive species have been recorded in Ravensbourne catchment:

Japanese Knotweed (Fallopia japonica) this species is found throughout the catchment.

New Zealand Pygmyweed (Crassula helmsii) This species has been recorded within the catchment.

Himalayan Balsam (Himalayan Balsamhhabitate) and competes for food and light, found throughout the catchment.

The Chinese Mitten Crab (Eriocheir sinensis) - burrows into riverbanks and can severely erode them leading to their eventual collapse. Found within the tidal section of the river.

Giant Hogweed (Heracleum mantegazzianum) - found throughout the catchment. [6]

Red-eared Terrapin (Trachemys scripta elegans) - Illegally released into the catchment by members of the public. An increasing threat to the waterfowl population.

Potential threats not yet present on the catchment:

African clawed toad; Alpine newt; American Bullfrog; Carolina water-shield; Killer shrimp; Marbled crayfish; Topmouth gudgeon; Asian hornet; Quagga mussel [7]

Waste water management

The highly urbanised nature of the Ravensbourne exacerbates pollution pressures, particularly through increased surface water run-off, storm sewage overflows and misconnections due to poor domestic plumbing. Information gathering throughout the catchment, from park users, from developers and from the boroughs themselves is a useful way to relay issues to both the Environment Agency and Thames Water. The boroughs work closely with developers to ensure that new and future development adheres to the strict guidelines for urban waste. However, home improvements conducted by builders unsure of the regulations have resulted in misconnections and ultimately untreated sewage discharging directly into our rivers. It is the intention of the catchment group to roll-out citizen-science pollution reporting to not only identify and address these issues but also enable us to reach our Water Framework Directive goals of a better water quality generally for the catchment.

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2 ACTION

We face an increased threat from flooding, pollution in our rivers and a spread in invasive plants and animals. We need to improve river water quality status in line with Water Framework Directive targets.

3 WHAT ARE THE SOLUTIONS?

Reducing flood risk

Flooding is a natural phenomenon that can be managed so that the frequency of occurrence, and the potential for damage, can be greatly reduced.

Historically, the rivers within the catchment have modified with hard-engineered solutions, such as concrete culverting, following significant flood events. Following a succession of such events in the 1960s much of our catchment was placed in concrete, straightened and removed from public sight. Though this has prevented more frequent smaller floods from occurring it has had a detrimental impact on the ecological and amenity value of the river. Reliance upon these channels to solely convey water quickly to reduce flooding, at the cost of all other needs for a healthy river, continues to leave a legacy that stands as an impediment to the quality of the river.

Since the 1990s a more innovative, and soft-engineered, option has been pursued; that of making space for water by storing it in open spaces and slowing its flow into the channel. This reduces the reliance on flow conveyance and enables the re-naturalising of the river. As a result, river projects in all four boroughs that have considered flooding, habitat, amenity and water quality together have contributed greatly to the reduction in flood risk along the Ravensbourne catchment in a more sustainable manner. With both sea and rain-water levels expected to rise over the next century it is likely that these measures will be tested further. It is important, therefore, that proposed new projects, such as the Lewisham and Catford Flood Alleviation Scheme in Beckenham Place Park and Ladywell Fields, are completed so as to enhance the catchment's preparedness for serious rainfall events. While major river enhancement projects mitigate against future climate change effects, there are other complimentary ways in which we can protect ourselves. One of the main contributors to flood water along urban waterways is rainwater run-off from roofs, roads, car parks and pavements. Water falling on these surfaces makes its way to the river much quicker than on natural ground. Less water being absorbed into the ground also means a larger volume enters the river. This leads to increased flooding from the river. To tackle this problem a new intervention measure, Sustainable Drainage System or SuDs, is being integrated into many developments in the Thames area. By mimicking natural run-off processes and creating a mosaic of natural surfacing it is possible to hold back rainwater and allow a more gradual process of rainwater delivery into our rivers. To identify sites for SuDS and to create and to enable flood alleviation measures in the future, an up-to-date map of landowners of our waterways must be developed.

Natural river corridors that attenuate, or hold, rainwater must remain viable in order for restored river sections to play their part in flood alleviation. The removal of invasive species such as Himalayan Balsam and Giant Hogweed, which undermine riverbank structure, can help in reducing this risk as they weaken banks and make them increasingly liable to erosion.

Water Quality

Balancing the interests of environmental protection and enhancement, flood risk, housing supply and economic growth is hard enough within a catchment but to improve the water quality of our rivers at the same time requires dedication from stakeholder partnerships. Planners work closely with developers to ensure that the viability of our rivers is upheld while borough environmentalists and community groups work together to remove waste and identify polluters along the catchment. Providing a target for everyone to work towards is the Water Framework Directive. The Water Framework Directive (WFD) passed by the European Union in 2000 and was brought into UK Law in 2003. It provides new and ambitious objectives to protect and restore aquatic ecosystems as a basis for ensuring the long-term sustainable use of water for people, business and nature. Member states must ensure that their water bodies reach "Good Ecological Status" or for waters that have been designated as Heavily Modified "Good Ecological Potential".

The Environment Agency (EA) through 11 River Basin Management Plans (RBMPs) is implementing WFD across England and Wales. The Thames River Basin Management Plan, which incorporates the Ravensbourne catchment, has been prepared under the WFD using the catchment-based approach (CaBA). The Thames River Basin Management Plan (TRBMP) covers a six-year statutory period of planning and delivery for the catchment. The TRBMP consults thoroughly with catchment partnerships and listens to concerns over policy delivery requirements of the Water Framework Directive. The Water Framework Directive introduces a formal series of six-year cycles. The first cycle will end in 2015 when, following further planning and consultation, a clear plan will be set out to achieve all of our targets for the second cycle by 2021.

To achieve this there must be a regular process of monitoring and measuring up and down the catchment by the Environment Agency, NGOs and community groups. Reporting should be made simple with interactive catchment maps highlighting where progress is being made and where more work is required. Achieving target status for water quality must be a collaborative effort in which a heightened sense of stewardship is developed along our rivers. An innovative model for change within a catchment was provided by the European River Corridor Improvement Plans (ERCIP) organisation. A collective approach was developed to create restoration projects in line with WFD objectives. Partnership Exchange visits were organised between European partners of ERCIP, with groups from across the EU visiting the Ravensbourne Catchment for an information exchange exercise.

Invasive species

Local authority policies are to ensure invasive species, such as but not limited to Japanese Knotweed and Himalayan Balsam, are eradicated and will do this themselves or with the help of environment charities, such as Thames21. The Environment Agency give advise to landowners on the removal of all invasive species and will monitor the safe disposal of some species. Since 2008, an annual volunteer-based event has been held along all of our rivers to tackle the problem of invasive species The 3 Rivers Clean Up is an NGO-led community initiative that has seen a vast reduction in invasive species numbers and helped improve biodiversity through plant and rubbish removal. Volunteers have received PA1 and PA6 training to chemically treat and remove invasive flora. Partnerships have been formed between the London Boroughs of Lewisham, Bromley, Greenwich and Croydon, Thames21 and the Quaggy Waterways Action Group, in addition to the many friends groups actively volunteering along the catchment, to tackle his problem.

In 2015 some 35 events were held during the 3RCU and 1,300 volunteer-hours were put in to held remove 200 sacks of rubbish and 2,000 invasive plants. Using experience gained from past years and with expert advice from the London Invasive Species Initiative and policy guidance from Defra's Non-Native Species Secretariat, catchment groups are well equipped to deal with existing invasive species while remaining vigilant of any unwelcome newcomers. With regards to more virulent invasive species, such as Japanese Knotweed, it is now illegal under EU law for landowners to host this species and more stringent measures can be taken for its removal.

To protect the catchment from the spread of existing invasive non-native species and the introduction of species, biosecurity guidelines must be widely promoted to all river users. The catchment partnership recommend following the GB non-native species secretariat's Check, Clean, Dry and Be Plant Wise guidelines.

Project Schedule

Most of the work carried out within the Ravensbourne catchment is done so in partnership with others. Often these partnerships are between council and volunteer groups or charities, Government departments and councils because we all have a shared responsibility to ensure that our rivers are as good as they could be. A list of these works is collated into a Project Schedule. The Project Schedule table, situated toward the end of the Catchment Plan, is a summarised list of works either proposed or active that will be of benefit to our rivers. You may recognise a project that you have heard about, seen in action or participated in its development and that is because the Project Schedule includes everything from site-specific community projects to catchment-wide strategy. The Project Schedule includes schemes for water quality enhancement, public amenity or river restoration yet can also include community activities such as the 3 Rivers Clean Up and Citizen Science projects that check the rivers for misconnections and other pollution. Many projects started out as discussions at the river's edge with individuals or groups during work-based events or on one of the many nature walks that take place along our catchment. The Project Schedule demonstrates the breadth of work along the catchment and the commitment of those engaged within it. The full list of projects runs to over 100 entries and this will be available once the Catchment Plan finds its online home. If a project on the list is 'Active' this means that it is underway and, if needed, funding has been found to see it through to conclusion. A project 'In development' is waiting for an element or two to proceed and those that are 'Proposed' are at the discussion stage where possibly community groups or landowners need to be consulted and applications made. Many of the projects on the list are aimed at achieving our Water Framework Directive targets of better water quality, biodiversity etc and it is hoped, with the help of volunteer organisations within the river catchment, that many of these will be developed and delivered in coming years so as to improve the quality of our Ravensbourne.

3 ACTION

Engage communities in flood planning, expand citizen science projects that monitor water quality and pollution and improve habitats for both plants and animals.

4 A NATURAL CATCHMENT

The Ravensbourne, like many urban rivers, is heavily modified due to urbanisation and flood defence engineering. As the space for rivers has been minimised and sometimes hidden, urban development over the last few decades has moved closer to the water's edge. As a counterbalance, river naturalisation schemes at Sutcliffe Park, Chinbrook Meadows and Ladywell Fields have re-established nature, creating more diverse and biodiversity-rich environments along the rivers Quaggy, Ravensbourne and Pool. Following the introduction of the railways in the 19th Century and the subsequent urban expansion in the early 20th Century, much of the natural river was lost and today some 50% of the catchment is deemed artificial. While the watercourses themselves face a slow process of naturalisation, the biodiversity within them is increasing at a faster pace and many of the river parks along the catchment have become important destinations for nature-spotters and other nature-based leisure activities such as bird walks, bat walks and tree identification events.

A summary of the boroughs' commitment to biodiversity and nature:

Greenwich

We recognise the importance of preserving our natural biodiversity and have:

- piloted a green roof scheme
- promoted biodiversity in our parks and open spaces
- implemented environmental good practices in our parks and open spaces
- designated Sutcliffe Park as a Local Nature Reserve
- set out plans to protect habitats and species in our Biodiversity Action Plan. [8]

Croydon

- Oversee the production and implementation of the Croydon Biodiversity Action Plan
- Champion and promote Croydon's biodiversity and its distinctiveness
- Seek opportunities for joint projects and partnership working
- Facilitate sharing of best-practice and skills
- Support and provide inspiration for local conservation projects, events and activities
- Monitor biodiversity and biodiversity action in Croydon
- Report back annually on its achievements
- Feed into regional and national BAP processes [9]

Lewisham

- To translate national targets for species and habitats into effective action at the local level,
- To identify targets for species and habitats important to the local area, reflecting the values of local people,
- To stimulate effective local partnerships to ensure programmes for biodiversity conservation are developed and maintained in the long term,
- To raise awareness of the need for biodiversity conservation and enhancement in the local context,
- To ensure opportunities for conservation and enhancement of biodiversity are promoted, understood and rooted in policies and decisions at the local level,
- To provide a basis for monitoring and evaluating local action for biodiversity priorities, at both national and local levels [10]

Bromley

The London Borough of Bromley's new Biodiversity Plan states: "The biodiversity surrounding us in Bromley was an inspiration for Charles Darwin and his insights into the natural world. This plan aims to sustain our local species and habitats for future generations, ensuring that a long-term strategy for conserving, protecting and enhancing biodiversity is in place. (London Borough of Bromley, Bromley Biodiversity Plan 2015 - 2020) [11]

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4 ACTION

Encourage more public events promoting nature along our rivers and be open to trans-boundary cooperation in meeting challenges.

5 COMMUNITY ACTION

Community action is where the catchment's strengths lie. Galvanised by events such as the 3 Rivers Clean Up, many 'friends' groups have been formed with the local rivers at the centre of their activities. The local charity Thames21 holds regular community events up and down the catchment for park user groups, schools and other river charities such as the Quaggy Waterways Action Group. These events concentrate on education, river enhancement projects, such as the River Pool Project, and waste removal. The recently founded Lewisham Parks Forum lobbies on behalf of the community to ensure that sustainable management strategies are in place for all greenspaces. Creekside Education Trust in Deptford hold regular walks, wades and talks for the local community and also have strong links with local schools and educators.

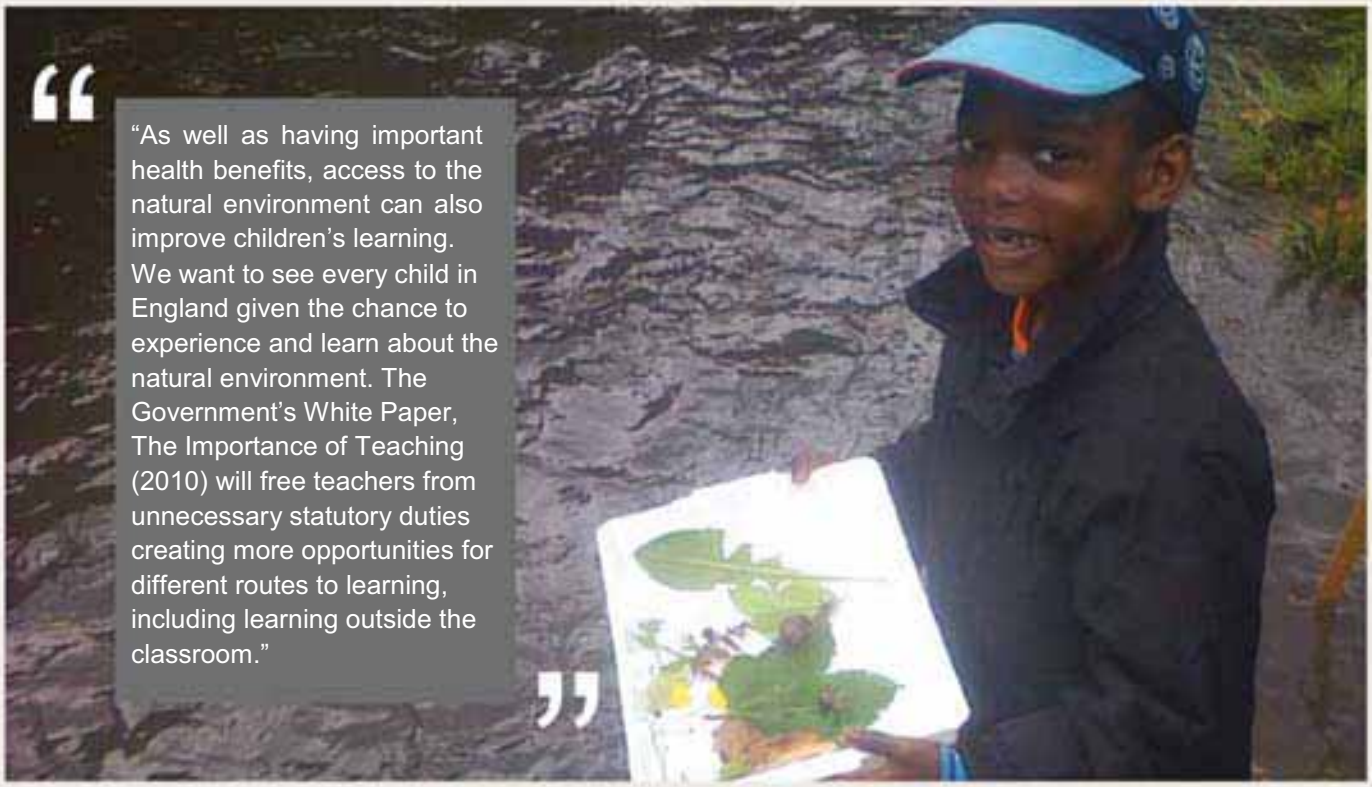
5 ACTION

Support volunteer programs and recognise the value of community-led activities and stewardship along the catchment.

6 EDUCATION AND LEARNING

Popular amongst schools, university groups and the wider community, the Ravensbourne catchment has proved to be an outstanding outdoor classroom. Boroughs, NGOs, user groups and children's activity groups provide an ideal pathway to the natural environment and undertake a wide array of learning activities. The Creekside Education Trust hold many low-tide events for schools while other charities such as the Quaggy Waterways Action Group and Thames21 hold river-learning events, including hydrology, flood alleviation and freshwater invertebrate identification for groups of all ages.

The importance of outdoor learning is clear, Natural England's Access to Nature states:



"As well as having important health benefits, access to the natural environment can also improve children's learning. We want to see every child in England given the chance to experience and learn about the natural environment. The Government's White Paper, The Importance of Teaching (2010) will free teachers from unnecessary statutory duties creating more opportunities for different routes to learning, including learning outside the classroom."

Educational programmes for both schools and the community along the catchment have proved popular and effective in increasing engagement with the catchment. Many schools undertake fieldwork, as part of their curriculum, at sites such at Sutcliffe Park.

Students from London's art colleges are regular visitors to the catchment while the Trinity Laban's Faculty of Dance, one of Europe's leading centres for the training of professional contemporary dance artists, is based by the Ravensbourne at Creekside.

In 2015, the photographer Tomos Brangwyn, some of whose images are in this document, held a Thames21-sponsored exhibition of his kingfisher photographs at the Stephen Lawrence Centre, which is by the Ravensbourne at Brookmill Park. Many people have been drawn to the river, and the exhibition, after seeing these kingfishers on the BBC's One Show, BBC Nature and many of the national daily papers.

6 ACTIONS

Ensure outdoor education and learning of river-based subjects are supported by all Local Authorities and introduce site-specific interpretation boards highlighting species and geographical features of interest.

7 COMMUNITY HEALTH

The provision of high quality public spaces along our river corridors enables increased public access to the natural environment. This in turn improves both the physical health and mental well-being of our community. Tackling issues such as child obesity, health within the ageing community and recovery from illness or injury are at the forefront of current health planning for the future within the four boroughs hosting the river catchment. Initiatives such as Walking for Health, Green Gym and Nature's Gym all help people remain active in life and offer engagement with our natural environment while for the younger generation, schemes like Project Wild Thing enable children to reconnect with nature. For more information go to:

www.projectwildthing.com
www.natureconservationlewisham.co.uk
www.walkingforhealth.org.uk

David Bond, director of the Wild Network, said: 'The formation of the Wild Network, a big and growing collective of organisations and individuals all passionate about getting children outside, provides a ray of hope. There are many, many people out there who care, and want to change things. Real people and real communities are doing great things to get kids back to the wild: from making the Ravensbourne accessible, to running the Big Garden Birdwatch to closing down their streets for play after school. We need to shout loudly about this great work, just like the competition shouts about their processed cheese and computer games.'

Engaging children and teenagers in river environments not only provides a close-up view of nature but also sows the seeds of potential stewardship for the future care of these often-urban spaces. Students that have visited the river with their school, return with their parents for open river events, thus creating a relationship that is ongoing. Of course, a hugely important aspect to this is a broad biodiversity of flora and fauna on offer within the catchment. Volunteers and community groups, the very people that participate in Nature's Gym and Green Gym activities, often manage this.

Natural England's Access to Nature programme observed that there are clear benefits associated with undertaking physical activity while spending time outdoors. As significant are the wider benefits that have been recognised including: recovery from stress, stimulating development in children, as well as providing opportunities for personal development and a sense of purpose in adults. The evidence also reveals that people living in urban areas with access to nearby green space have better mental health than their peers in areas without such access. [12]

The synergy between local initiatives in the natural environment and long-term Government goals in tackling health in the community is one we support. With pressure on the NHS an almost daily news item it is clear that supporting schemes like Nature's Gym would have multiple benefits.

The Department for Environment Food & Rural Affairs (Defra) are in full support: 'We need to make enhancing nature a central goal of social action across the country. We want to make it easier for people to do the right thing, with action in the health and education systems and in our communities,' they stated in their report The Natural Choice: Securing the value of Nature. 'We want to help local authorities use their new duties and powers on public health, Public Health England will publish practical evidence about improving health,including through access to a good natural environment.' [13]

7 ACTIONS

Provide support for community health projects such as Nature's Gym and expand the community health offering in line with NHS advice.

8 RESILIENCE

Protecting ourselves from the effects of climate change is a key motivational factor in all planning considerations along the Ravensbourne catchment. The environment in which we live is still prone to flooding despite our best efforts in the past. Therefore, we must do all we can to raise our resilience levels to not only protect our natural and built environment but also our well-being and our cultural heritage. Smaller scale schemes such as Chinbrook Meadows compliment larger flood alleviation measures like Sutcliffe Park and the proposed Lewisham and Catford Flood Alleviation Scheme. These measures ensure we have a high level of preparedness.

Given the history of flooding within the catchment it is essential that residents are kept up-to-date with new and proposed alleviation measures, projects where flood water will be held up and the boroughs' strategies to tackle rainwater run-off. Both the London Borough of Lewisham and the Royal Borough of Greenwich are working towards new Local Flood Risk Management Strategies, which will be available to the public in 2015.

The Thames River Basin District is, in places, very heavily urbanised and is home to a population of around 15 million people. This number is expected to rise by 1 million by 2025. This places pressure on the water environment from existing and new physical modifications of water bodies related to business and industrial growth as well as infrastructure, such as protection from flooding, facilities for waste water and urban development. [14]

According to UK Climate Impacts Programme (UKCIP), by 2050 temperatures in the Thames River Basin District are expected to rise by 2 to 4°c. Seasonal variations in rainfall could also result in wider issues such as the increase in summer flooding. Within the UK, levels of winter rainfall are rising and summer rainfall is decreasing. This again could affect our rivers and infrastructure services through the amount of water we have available for our use at different times of the year.

When considering the choices for river basin management planning the following aspects should be taken into account.

- The densely populated urban areas and associated infrastructure, which requires protection from flooding and the impacts of climate, change.
- The reliance of the population on the drinking water supply.
- The predicted impacts of climatic changes on our water environment and the subsequent consequences on population, land use and amenity.
- The potential changes to wildlife, habitats and ecological corridors that rely on a high quality water environment.
- The effects on our cultural heritage of any significant changes to the management of the water environment.
- The importance of managing our rural areas for example, through agricultural practises and the use of water within these.
- The importance of surface water systems to provide corridors for flora, fauna and recreational activities as well as the importance of these systems as iconic landscape settings.

Urban drainage flooding within the Ravensbourne catchment is highlighted in the EA TE2100 Plan document as a concern, as is fluvial and pluvial (from hard-surface run-off) flood risk in general. Therefore, the introduction of well designed and engineered Sustainable Urban Drainage Systems (SuDS) could provide a measurable benefit to the catchment. Under the Flood and Water Management Act 2010, in most cases it is the responsibility of local authority planners to assess applications to install SuDS. All new development, of 10 or more units, along the catchment should contain an element of SuDS while the retrofitting of these measures should be a priority where possible.

Background

Flooding from the River Ravensbourne has been recorded in the Lewisham and Catford area since 1809. The last major flood was in September 1968, when heavy rainfall caused the river to burst its banks, flooding several hundred homes and businesses. Less severe river flooding was also recorded in 1977, 1992 and 1993.

Currently there are approximately 1,500 homes and businesses in the floodplain of the River Ravensbourne and Honor Oak Stream between Catford and Lewisham. Of these, approximately 400 homes and 280 businesses are at ‘high’ or ‘medium’ risk of river flooding. If nothing is done, climate change will increase the number of properties affected.

The proposals

Over recent years the Environment Agency has been working with the London Borough of Lewisham to investigate how to reduce this flood risk. A wide range of ways to do this has been considered, including raising walls and flood storage in various locations. The proposed scheme, which will reduce the risk of flooding to approximately 400 homes and 280 businesses locally, is a combination of three elements:

Flood storage at Beckenham Place Park

As one of the largest green spaces in the area, the park provides an opportunity to temporarily store flood water upstream, keeping it away from homes and businesses. This means that most defences downstream won’t need to be raised. To do this, the park to the east of the railway line would need to be re-landscaped to include raised earth embankments. This work would also provide an opportunity to enhance this side of the park. It is expected that the space would only be used for storing floodwater every few years.

Works on the Honor Oak Stream in Ladywell

Two options have been identified to reduce the localised risk of flooding from the Honor Oak Stream. These are creating a new small flood storage area in Slagrove Place or pumping water from the stream in times of flood to the River Ravensbourne.

Localised works to existing river walls

Even with the proposed flood storage at the park, Environment Agency river investigations have shown that there are eight low points in the defences downstream where defences need to be raised. Raising these low points will allow more water to be held within the river channel. This would be done by raising the existing walls, embankments or footpaths at these eight locations.

Benefits of the scheme

Approximately 400 homes and 280 businesses would benefit from a reduced risk of flooding and many more businesses would be able to remain open during more extreme weather conditions.

Key infrastructure would also benefit from a reduced risk of flooding. This includes nine electrical substations, Deptford pumping station, critical roads, the Docklands Light Railway and the national rail line between Ladywell and Catford Bridge. The Environment Agency estimates that a total of £240 million worth of flood damages could be avoided if these works are done.

The plan for the flood storage area includes naturalising a section of the river through Beckenham Place Park (similar to other successful sites that have been delivered, including Sutcliffe Park and Ladywell Fields). This would create a new vibrant space for the local community to use.

Heritage Lottery funding

The Environment Agency is working in partnership with the London Borough of Lewisham and local interest groups, and are in the process of bidding for Heritage Lottery funding. If successful, this funding will help ensure that these flood alleviation proposals in the eastern half of the park form part of a joined up plan to rejuvenate the whole of Beckenham Place Park. This will create a new space for recreation and education for more local people to enjoy.

Funding

Currently it is expected that the scheme will cost a total of £15.6 million. The Environment Agency is completing a business case for the proposal which will set out the principles of the scheme and whether it is suitable to move forward to detailed design. To allow the scheme to go ahead external funding sources and planning permission will be needed. The Environment Agency is currently working with London Borough of Lewisham on the identification of potential funding sources.

8 ACTIONS

Support flood planning across the catchment, introduce Sustainable Urban Drainage measures to combat diffuse pollution/run-off from roads and hard-surfacing and raise awareness of invasive species.

9 INVESTMENT AND FUNDING

As an urban catchment with such a high percentage of engineered stretches of river, the Ravensbourne provides an ideal platform for the development of funding and investment partnerships. These address issues such as access to nature, flood alleviation and social cohesion to name just three. The Project Schedule within this Catchment Plan highlights the ongoing and aspirational works that are needed to improve our rivers. Friends groups, NGOs and councils, who all contribute to the Project Schedule, are encouraged to be creative in seeking funding for improvement and many currently work together toward this aim. Organisations within the catchment strive to secure funding opportunities, seeking to emulate the many successes of the past, including:

Norman Park (Bromley): A partnership between the Environment Agency and the London Borough of Bromley, the project involved the removal of a culverted section of the Ravensbourne to restore an open channel and create an important habitat link with Scrogginhall Woods to the south. This provided both improved public access to nature and improved biodiversity in the park.

South Norwood Country Park (Croydon): The introduction of a lottery-funded play area to attract families to the park, within the London Borough of Croydon. This Local Nature Reserve also attracts a large number of birds to its wetlands and remains increasingly popular with birdwatchers and walkers.

Ladywell Fields/Cornmill Gardens (Lewisham): A QUERCUS project, financed by the EU Life Environment Fund. QUERCUS stands for 'Quality Urban Environments for River Corridor Users and Stakeholders'. Between 2005-09 QUERCUS, with the London Borough of Lewisham, restored two sites with the intention of reducing crime in the area and increasing public access. Some 80% of Ladywell park users felt it had become a safer place while both sites provided greater opportunities for wildlife to thrive.

Sutcliffe Park (Greenwich): The Quaggy River Flood Risk Management scheme adapted a number of public and private multifunctional green spaces linked by the Quaggy River in order to reduce flood risk and the potential impacts of climate change for 600 homes and businesses, and more than 4000 people living and working in the London boroughs of Greenwich and Lewisham. Completed in 2003, this partnership was between the Environment Agency and the London Borough of Greenwich.


Norman Park


Sutcliffe Park


Chinbrook Meadows


Ladywell Fields


Linear Park


Cornmill Gardens

Rivers and People project was funded through Natural England and the Big Lottery's Access to Nature scheme and delivered in partnership between Lewisham Council and Creekside Education Trust. The four-year scheme, which ran from 2009, encouraged more people to benefit from being outdoors through an engagement with the natural environment. The project's success was largely down to the commitment of delivery officer, Chris McGaw, and the foresight of Lewisham's Ecological Regeneration Manager Nick Pond and supporting officers. Imparting their broad knowledge of biodiversity, a broad spectrum of community members were introduced to the river network and its associated wildlife.

Activities offered were all free of charge and include guided walks and wades along the Ravensbourne, Pool and Quaggy rivers, natural history workshops, practical conservation sessions for biodiversity and amenity benefit, and occasional river clean-ups to remove unwanted debris and invasive species.

Schools were particularly welcome as the Rivers and People project offered a wide range of water and wildlife-related activities to link in with the curriculum. The legacy still carries on today as many activities within the catchment are offered under its banner.

9 ACTIONS

Encourage and facilitate project collaboration and funding bids, promote cross-boundary cooperation between Local Authorities and encourage broader NGO involvement in the catchment.

10 A UNIQUE PARTNERSHIP

Since its creation in 2012, the Ravensbourne Catchment Improvement Group (RCIG) has been meeting to promote and encourage others to aspire to a more sustainable future for our rivers. The RCIG includes representatives from the London Boroughs of Lewisham, Bromley and Greenwich, the Environment Agency, river charities Thames21 and the Quaggy Waterways Action Group and the London Wildlife Trust. Consultations have taken place throughout the catchment over the last two years to gauge public opinion on the health of our rivers and collect a 'wish list' for the future.

A less heralded partnership, and one that enables continuous care and stewardship across the catchment, has been between the boroughs, NGOs and the many volunteers who work within the river landscape. Weekly scheduled events, fully supported with equipment (and tea and biscuits!) enable creative in-channel work to be undertaken that both improves the aesthetic and encourages a more biodiverse catchment. Also, new partnerships between NGOs and developers have been formed to create unique paths to river improvement while future plans are in place, as mentioned in Lewisham's River Corridors Improvement Plan Supplementary Planning Document, for a new Rivers Forum with both community groups and London boroughs participating.

10 ACTION

Support the Ravensbourne Catchment Improvement Group as it plans ahead for the benefit of the river and the communities that enjoy them.


Keith

"It's a much more pleasant environment to walk along toe river now. It has helped me appreciate more about the river and how you can improve things, both for the wildlife and for the people who live here. The most useful skill I've learnt is to create a dead-hedge. I didn't even know what one was before. When groups come down here and have questions about the river I can actually answer them myself and give a reasonable account of things."

PUBLIC CONSULTATION

Ahead of the planning and preparation of this document the public, the river community, were consulted at length to gauge their aspirations, dislikes and delights around the catchment. All four boroughs hosted consultation days and events where hundreds of interested people, many already volunteers, made their feelings known. Often, if matters raised were of some urgency then the relevant agency, such as the Environment Agency, was contacted for their experts to take action and report back. Officers at the boroughs of Greenwich, Bromley, Croydon and Lewisham, and other RCIG partners, have been of great help during the two-year consultation process. Many of the community priorities voiced during the process have found their way into new projects and aspirations for the catchment. There were recurring themes addressed by participants of these events, such as safety, public access, effects of climate change and new development. The following word clouds demonstrate many of these challenges.

SUMMARY AND FUTURE DEVELOPMENTS

Many of the challenges facing the catchment today are borne out of the need to counter the engineering decisions taken in the past and to mitigate against the potential impacts of climate change in the future.

Successful river restoration projects have demonstrated what can be done to reverse constraints on public access and improve naturalization and biodiversity. Tackling the impacts of a densely populated urban environment on our river channels remains paramount for both the catchment partnership and the communities that enjoy this amenity. There are clear priorities for the catchment: improving flood defences, improving the public amenity value of our rivers, creating a catchment more welcoming to nature and improving water quality. The Project Schedule will address these issues and, with the help of those living around the catchment, create a strategy for future improvement.

The Ravensbourne catchment does not have an acceptable level of water quality and this largely due to urban impacts like, rainfall run-off from road, car parks etc, plumbing misconnections and industrial waste. If the work done by borough planners, the Environment Agency and volunteer groups is to be fully appreciated then further education and outreach is needed to prevent further degradation of our rivers. The visible impact of volunteers at work within the catchment often has a positive effect on those that live in the surrounding area and this can be a useful tool for changing perceptions of our rivers. This nurturing of nature, and the message it contains, should be fully supported and more funding opportunities should be made available to committed groups along the catchment. As the boroughs within the catchment feel an increasing pinch on their budgets, a way must be found to maintain our rivers and the parks that support them. The Ravensbourne catchment is extremely fortunate to have a lot of people on its side, individuals and groups that care and remain active on its behalf. Communities are broadly supportive of large projects that work against climate change impacts because they have experienced enhancement projects such as Sutcliffe Park, Brookmill Park, Cornmill Gardens and Ladywell Fields and have seen the positive results.

To sustain long-term solutions there is a potential to link elements of the current EA-administered Catchment Fund with a new locally administered catchment fund for the future. This would support and increase the non-governmental work being carried out along the catchment and could be backed up by funding from either government and/or private contribution and administered by an independent broker such as a river-based NGO or trust.

By working together we can take the necessary steps to improve the environment and provide benefits to both society and the local economy.

ACTION SUMMARY

1 Catchment fact & figures:

South East London is one of the most multicultural areas of the UK, this plan is a welcoming hand and an invitation to share our aspirations for the future of the rivers and waterways of the four Local Authorities.

2 What are the Challenges:

We face an increased threat from flooding, pollution in our rivers and a spread in invasive plants and animals. We need to improve river water quality status in line with Water Framework Directive targets.

3 What are the Solutions:

Engage communities in flood planning, expand citizen science projects that monitor water quality and pollution and improve habitats for both plants and animals.

4 A Natural Catchment:

Encourage more public events promoting nature along our rivers and be open to trans-boundary cooperation in meeting challenges.

5 Community Action:

Support volunteer programs and recognise the value of community-led activities and stewardship along the catchment.

6 Education and Learning:

Ensure outdoor education and learning of river-based subjects are supported by all Local Authorities and introduce site-specific interpretation boards highlighting species and geographical features of interest.

7 Community Health

Provide support for community health projects such as Nature's Gym and expand the community health offering in line with NHS advice.

8 Resilience

Support flood planning across the catchment, introduce Sustainable Urban Drainage measures to combat diffuse pollution/run-off from roads and hard-surfacing and raise awareness of invasive species.

9 Investment and Funding

Encourage and facilitate project collaboration and funding bids, promote cross-boundary cooperation between Local Authorities and encourage broader NGO involvement in the catchment.

10 A Unique Partnership

Support the Ravensbourne Catchment Improvement Group as it plans ahead for the benefit of the river and the communities that enjoy them.

Tomos

Wildlife on the Ravensbourne, such as the kingfisher, relies almost solely on the constant supply of clean and oxygenated water. While human litter and concrete encased channels are tolerated, polluted water will end the life of many of the creatures that Londoners, such as myself, have come to cherish”

Tomos Brangwyn
British Wildlife Photographer
of the Year 2015 (Urban Wildlife)

All kingfisher images courtesy of Tomos Brangwyn at www.tomosbrangwyn.com

Other photography: LBC and London Borough of Lewisham

RAVENSBOURNE PROJECT SCHEDULE

Project Status: A: Active B:In Develoment C:Proposed	Borough - River	Project Name	Project Objectives and Measures	
A	Lewisham - Ravensbourne	Ladywell Fields (N) - Weir modification	To modify weir, repair washout on parkside bank and improve flow into secondary channel and address siltation issues	
C	Lewisham - Pool	Winsford Road gauging station removal, Linear Park	Winsford Road gauging station removal. Total removal is desired outcome as the weir is a major obstruction to fish passage. This structure is directly upstream of a well know site for fish	
B	Bromley - Pool	Cator Park restoration - Cator Park (Beck and Chaffinch Brook)	The River Pool at Cator Park is presently fenced-off from public view in a deep, linear concrete channel. This project will reconnect the river with Cator park for the benefit of habitat creation/biodiversity, recreation, aesthetic improvement and an enhanced level of flood protection. Weir removal, concrete removal, meander creation. Project has potential to improve SINC value with natural substrates, in-stream and marginal vegetation to allow natural ecology.	
A	Lewisham/ Greenwich. Quaggy Ravensbourne	Sustainable Urban Drainage (EA)	SuDS practical interventions to improve water quality within the catchment. Sites visited: The Tarn, Grove Park Ditch (Chinbrook) and Downham Spring Brook.	
C	Lewisham - Pool	River Pool Linear Park & Riverview Park Renewal	Removal of toe boards; removal of concrete walls; river edge planting; re-meandering; localised narrowing	
C	Croydon - Pool	South Norwood Country Park - Concrete Removal	Stream re-alignment, landscaping to improve biodiversity, public access and attenuation	
C	Bromley and Lewisham	Weir modification and/or removal - Ravensbourne	Weir at the following locations for possible modification or removal, to improve fish passage. Keston Common; Hayes Lane; Dainford Close; Ford Mill; Beckenham Hill (Homebase); Glassmill Lane; 'Steps' Croydon Road, Keston Mark; Rav Bus Centre Keston.	
C	Bromley - Ravensbourne	Crayfish assessment	Caesar's Well, Keston. Evaluate extent of colonisation of the Narrow Clawed Turkish Crayfish and assess its impact on native ecology. If these are found to impact or risk impacting WFD ecological status undertake measures to eradicate or control population.	
B	Bromley - Ravensbourne	Glassmill - Online lake management	Flood defence structure has already been moved. Remove impoundment (Glassmill). Also look at new channels through former lake (assumed to mean Glassmill). Increase attenuation capability of online lakes in upstream waterbodies. Dredge or extend existing lakes: Glassmill Reservoir.	
A	Lewisham - Ravensbourne	Beckenham Place Park – Lewisham & Catford Flood Alleviation Scheme	Floodplain and habitat restoration with significant habitat and landscape improvement. Part of the Lewisham and Catford Flood Alleviation Scheme. Further improvements to Beckenham Place Park alongside the Flood Alleviation Scheme with HLF funding.	
B	Bromley - Ravensbourne	Keston Ponds remedial work	De-silting and restoration of historic fish ponds complex; biodiversity & access improvements; interpretation	

	Themes, outcomes and project drivers	Delivers on Action Summary Point..	Project Background	Lead Partner(s)
	Improve river landscape, enable fish passage and restore intended hydrology	3, 5, 8, 9	NGOs, Lewisham and community concern over failing weir. Thames21 proposed project to Lewisham Gateway's Volker Fitzpatrick. Lewisham/Volker take forward.	LB of Lewisham (Nick Pond) and Volker Fitzpatrick
	Restore nature, create fish passage and increase biodiversity. WFD.	4, 8	Removal of large concrete gauging station and downstream drop/weir would enable fish passage and improve aesthetics	N/A
	Restore nature, improve public and natural amenity and influence behavioural change. Natural amenity.	3, 4, 5, 6, 7, 8	On the RRC project list and described in the All London Green Grid (ALGG) Area 6 list	EA - David Webb
	Improve water quality in line with WFD targets	2, 3, 4, 5, 6, 7, 8, 9, 10	Intervention designed to improve water quality status at known harmful outfall points to positively impact catchment WQ status	EA - Peter Ehmann & Thames21 (Lawrence Beale Collins)
	Improve biodiversity and public amenity	4, 8	Channel uniform with natural bed and armoured banks. Lack of channel diversity and extended lengths of shallow water. Steep banks results in poor connectivity between river and adjacent land.	Thames21
	Improve biodiversity and public amenity. Flood alleviation.	4, 5, 7, 8	Opportunity to break river out of concrete	EA - David Webb
	Restore nature, create fish passage and increase biodiversity. WFD	3, 4, 5, 7, 8	During the winter of 2013/14 many fish species were 'washed through' and their passage back needs to be made possible	N/A
	Invasive species control	3, 4	Reporting and control of invasive species along the catchment is very good. Reports suggest incoming invasive fauna in Keston.	Thames21 & LISI
	Improve biodiversity and public amenity	3, 4, 5, 8	Opportunity to address potential flood waters in the upper catchment by removing hard surfacing	Thames 21, EA
	Flood alleviation, biodiversity improvement and public amenity enhancement	3, 4, 5, 6, 7, 8, 9	Driven by a need to have a major flood alleviation scheme south of Lewisham. Will benefit 400 homes and 280 businesses and prevent estimated £240m in flood damage.	EA - Richard Peddie & LB of Lewisham
	Improved hydrology, biodiversity and public amenity	3, 4, 5, 6, 7, 8	Long-term plan for LB of Bromley and the London Wildlife Trust to improve Keston Ponds	Bromley (Jenny Price) & LWT

Project Status: A: Active B:In Develoment C:Proposed	Borough - River	Project Name	Project Objectives and Measures	
A	Bromley - Ravensbourne	Langley Nature Reserve, Kelsey and Eden Park	Footpath construction, benches, gates, new signage, woodland thinning work and coppicing. Pond borders.	
C	Lewisham - Pool	Catford - Weir modification and/or removal	Catford – directly weir upstream of River Pool confluence. Investigate options to improve fish passage. Possibly remove or modify structure.	
A	Lewisham - Ravensbourne	Depford Bridge to Lewisham centre - Eel passage	From Deptford Bridge upstream to Lewisham Collegeweir and Elverson Rd weirs, create fish and eel passage.	
C	Lewisham - Ravensbourne	Catford Bridge Station Culvert	Re-open existing culvert immediately to the south of Catford Bridge Station. Awaiting lifespan of business units to expire then de-culvert between dual carriageway and railway. Add deflectors in culvert to aid fish passage. Create link between Linear Pk and Ladywell Fields	
C	Lewisham - Ravensbourne	Ravensbourne Channel Improvement	Increase in-channel morphological diversity. Add gravels in concreted and straightened sections. Create low flow channel at seven sites between Bromley Rd and Deptford. Introduce floating nesting beds.	
A	Lewisham, Ravensbourne	Kent Wharf Redevelopment	Demolition of the existing buildings and four 12 to 15 storey buildings to provide commercial and residential floor space. In planning. Opportunities for improved riverside access and biodiversity enhancement to river wall. Paid volunteer ecological management of river terraces proposed by Creekside Education Trust.	
A	Lewisham - Ravensbourne	Faircharm Trading Estate Redevelopment	A remodelling, repair, restoration and conversion of two existing buildings fronting the site to contain commercial uses. At the rear, demolition of the existing buildings is proposed, with redevelopment comprising four new buildings ranging in height from six to 12 storeys to provide commercial and residential floor space - planning approval in place. Opportunities for improved riverside access and biodiversity enhancement to river wall. Eco fenders planned for river wall.Creekside Education Trust detailed input to landscaping assessment and new designs and planting possible. Paid volunteer ecological management of landscape and river terraces proposed by Creekside Education Trust.Swift , House Martin and Bat boxes proposed.	
B	Lewisham - Quaggy	River Quaggy at St Stephens Church	Between Lewisham Police HQ and the re-entering of the Quaggy River into the Lewisham Road culvert. An opportunity to open up the river and reduce the concrete	
C	Greenwich & Lewisham - Quaggy	Grove Park fish pass	Add fish pass to weir at Grove Park, possibly lower weir height. Improve fish passage at Sutcliffe Park and Manor House Gardens and remove Chinbrook Road Ramp.	
C	Bromley, Greenwich and Lewisham - Quaggy	Quaggy channel Improvements	Deflectors and habitat featuresin channel. Opportunities around Mottingham and Mottingham Farm, Sydenham Cottages, Blackheath Sports Ground, Clarendon Rise. Approx 5m wide, for 100metres, split across 2km of natural river.	

	Themes, outcomes and project drivers	Delivers on Action Summary Point..	Project Background	Lead Partner(s)
	Improve biodiversity and public amenity	3, 4, 5, 6, 7, 8, 9	A Forestry Commision 'Woodland Improvement Grant' will benefit 30 woodland areas in the borough of Bromley including some that host the Ravensbourne.	Bromley (Jenny Price)
	Fish and eel passage	3, 4, 5, 8, 9	Identified by EA and Thames21 as an obstacle to restoring fish population upstream	N/A
	Improve biodiversity and WFD status	3, 4, 6, 8, 9, 10	Funded by the EA as the Catchment Partnership Action Fund 2015/16 and put forward by Thames21	Thames21 (Vic Richardson & Lawrence Beale Collins)
	Restore nature and introduce amenity landscaping	3, 4, 6, 8	Proposed improvement to heavily modified section of the river. Waterlink Way.	N/A
	Improve biodiversity and public amenity	3, 4	Site identified where concrete cannot be removed. Lewisham example at Wearside with nesting sites.	N/A
	Improvement to Creekside Education Trust offering	5, 6, 7	Lewisham Planning http://planning.lewisham.gov.uk/online-applications. Kent Wharf Redevelopment.	Kent Wharf & Creekside
	Improvement to Creekside Education Trust offering & biodiversity and WFD	5, 6, 7, 9	Lewisham Planning http://planning.lewisham.gov.uk/online-applications Creekside Education Trust and Denne Ltd design and wildlife advice on landscape planting and volunteer management.	Faircharm & Creekside
	Restore river. Inprove public amenity.	3, 4, 5, 6, 7, 8, 9	Project has £100k set aside following earlier development along this stretch	Quaggy Waterways Action Group
	Fish and eel passage	3, 4, 6, 8	Fish passage to upper catchment improvement required for WFD purposes	N/A
	Improve biodiversity, fish/eel passage and public amenity	3, 4, 5, 6, 7, 8	Within EA Measures and one of Thames21 and QWAG's joint plans for river enhancement.	Thames21 & QWAG

Project Status: A: Active B:In Develoment C:Proposed	Borough - River	Project Name	Project Objectives and Measures
C	Greenwich - Quaggy	Colfes School	Break river out of concrete and naturalise. Introduce meanders, natural fluvial geomorphological processes and improve biodiversity. Improved flood alleviation to downstream areas. Integrate with school sports facilities and buildings to provide educational facility for school that could be shared with others. Provide riverside walk to link existing river restorations in Chinbrook Meadows and Sutcliffe Park. Potential for extending the current GREEN CHAIN WALK through Chinbrook Meadows northwards into Greenwich and award-winning Sutcliffe Park, alongside a naturalised urban river. Provide natural amenity and green pedestrian walk within urban environment.
C	Lewisham - Quaggy	Manor House Gardens	Improve public access to river within Manor House Gardens.
C	Lewisham & Bromley - Quaggy	Mottingham Farm/ Mottingham Lane	Divert river at Mottingham Lane/Winn Road junction to W of Hadlow College and into meadow E of Mottingham Lane. This removes concrete channel to W of Mottingham Lane and re-establishes Quaggy in old channel with original substrate
C	Greenwich - Quaggy	The Tarn	The Tarn suffers pollution at outfalls due to misconnections. EA have passed a number of these to Bromley and Greenwich. History of fish and fowl death through pollution/disease. To introduce SuDS, reduce misconns and improve water quality. Transfer reed beds from Sutcliffe Park to Tarn through volunteer projects. Raise awareness with local businesses re: pollution.
C	Bromley - Kyd Brook (Quaggy)	Gumping Wood at Crofton	Habitat Improvement and bank re-alignment following flood damage. Re-open riverside path.
A	Lewisham, Bromley, Greenwich & Croydon - Ravensbourne, Quaggy & Pool	Tackling Urban Diffuse Pollution	Tackling Urban Diffuse Pollution with EA, Thames Water and voluntary sector action. Dealing with Surface Water Outfalls (SWO), Polluted SWO, Sustainable Urban Drainage, educating business/landowners, fixing misconnections. Identification of potential SuDS sites and polluting outfalls.
C	Lewisham, Bromley, Greenwich & Croydon - Ravensbourne, Quaggy & Pool	Tackling Rural Diffuse Pollution	Tackling Rural Diffuse Pollution. Approx 62km of catchment with 21 farms. Of 6194 hectares of farmland, approx 500 is arable with the remainder pastoral. Costs from Agricultural Diff Pollution tool.
A	Lewisham, Bromley, Greenwich & Croydon - Ravensbourne, Quaggy & Pool	RWCD - Water Quality testing for the community - Whole Catchment	Undertaking water quality testing during community events between May and September 2015. Community volunteers to train as WQ testers and upload data to Cartographer. Identify failing sites and see what measures can be taken to improve
A	Lewisham, Bromley, Greenwich & Croydon - Ravensbourne, Quaggy & Pool	3 Rivers Clean Up	Volunteer-led initiative running since 2008 to remove invasive species and rubbish from Ravensbourne catchment. Actions in line with WFD targets, event sponsored by Thames21, LB of Lewisham and London Invasive Species Initiative with all work undertaken by volunteers. 2015 - 30 events, >6k Inv. plants removed.

	Themes, outcomes and project drivers	Delivers on Action Summary Point..	Project Background	Lead Partner(s)
	Restore river, improve biodiversity, introduce public anemity and support healthy lifestyles	3, 4, 5, 6, 7, 8, 9	The Quaggy at this point lies within a straight concrete channel, inside a 6 metre strip enclosed by high fences. The fenced off strip runs through school and private playing fields. From the upper (southern) end it is possible to walk through largely green space to Chinbrook Meadows and a section of the Green Chain walk where the river was restored in 2002. From the lower (northern) end it is a short distance to Sutcliffe Park. Enhancement would connect these two restored sections for wildlife and people	QWAG
	Restore nature and introduce amenity landscaping	3, 4, 5, 6, 8	Long seen as a project by Friends of Manor House Gardens, Quaggy Waterways Action Group and Thames21	QWAG/Thames21
	River restoration and increased biodiversity and flood-water attenuation	3, 4, 5, 8	Upstream of 2013 flooding site and opportunity to introduce flood storage. Long seen as having potential for concrete removal.	EA & Thames21
	Reduce pollution, improve water quality and improve biodiversity	3, 4, 5, 6, 7, 8, 9	Landscaped garden and traditional 'Pleasance'. There is also a picnic area and an 18th Century ice wel that served Henry VIII's Eltham Palace. Problems with WQ reported at length by Friends of the Tarn.	Royal Borough of Greenwich/EA/Thames21
	Restore river landscape and public amenity and repair flood damage	3, 4, 5, 6, 7, 8, 9	Riverbanks along stretch of Gumping Wood damaged during 2013 rain events. Footpath closed. Remedial work deemed financially prohibitive by Bromley. Good opportunity for partnership funded project.	EA (D.Webb) & Bromley (Landscape Group)
	Improve water quality in line with WFD targets	3, 4, 5, 7, 8	Necessary project to identify and eliminate urban diffuse pollution which is seen as major barrier to achieving improved WFD status for rivers.	Thames21
	Improve water quality in line with WFD targets	3, 4	Recognising that the catchment, while predominately urban, also hosts farming. Run-off from both arable and pastoral needs monitoring.	N/A
	Involve community in WQ testing and set up forward traning	3, 5, 6, 9	Need to spread coverage of WQ testing to identify failing river sites for future work. Community request to get involved.	Thames21
	Improve biodiversity through volunteer action.	3, 4, 5, 6, 7, 8, 9	Since 2008 the 3RCUand its volunteers have removed giant hogweed, Himalayan balsam and japanese knotweed. In 2016 target will include terrapins/turtles	Thames21

WHAT WILL ORGANISATIONS DO?

Thames Water Utilities Ltd: Responsible for maintaining, improving and extending their water mains and other pipes. Duty to provide and maintain and system of public sewers so that areas they are responsible for are effectively drained.

Environment Agency: Responsible for managing flooding from main rivers to the sea. Strategic overview for all flooding sources and coastal erosion. Responsible for water quality, water resources, conservation and ecology.

London Boroughs of Lewisham, Bromley and Croydon and the Royal Borough of Greenwich: Management of surface water flood risk, biodiversity, public access and public safety. Education and public engagement.

Thames21: Conservation and restoration of the Ravensbourne's waterways. Promotion of sustainable, holistic and integrated catchment management through engagement.

London Wildlife Trust: Protection and enhancement of wildlife and wild places, public engagement and education

Quaggy Waterways Action Group: Work towards conservation and restoration of the Quaggy and Kid Brook and continue public engagement work.

Creekside Education Trust: Creekside will continue to provide learning and public access events at their unique resource by the confluence with the Thames.

WHAT CAN YOU DO?

All business owners:

Please visit **www.connectright.org.uk/** to find out about good drainage practise. The majority of pollution in the catchment is from misconnected drains and from some businesses tipping waste down roadside drains, straight into the river! If you're unsure about what you can or can't do please contact the Environment Agency on 03708 506 506

For information on Sustainable Drainage (SuDS) please contact **www.thames21.org.uk**

All community members:

The Ravensbourne catchment hosts many friends groups and user groups of river parks that are always looking for new members. For further information on these groups contact your local authority. For a range of practical river work sessions, such as habitat management and river clean-ups please contact:

Thames21 - **www.thames21.org.uk**

Creekside Education Trust - **www.creeksidecentre.org.uk**

London Wildlife Trust - **www.wildlondon.org.uk**

London Borough of Lewisham - **www.natureconservationlewisham.co.uk**

Croydon and Surrey Conservation Volunteers - **www.tcv.org.uk/london/croydon**

Chris

"The rivers seem to be cleaner than before. I see the difference all the work there has made, so now you actually see it being used and you see the river looking good, so it's fantastic. I've been involved with doing a lot of the work to the river pool that has involved re-naturalising parts of the river channel and returning it back to something closer to nature, the pulling of the invasive plants and treating of invasive plants and that has tended to be my involvement. This is sort of where I see the difference because I didn't know about this sort of thing 2 years ago. Lewisham's Rivers and People Project enabled me to get PA1 and PA6 training, to tackle invasive flora species, and I now go out on my own to remove it all."

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Friends of Sutcliffe Park

Friends of Brookmill Park

Ladywell Fields Friends

Friends of Beckenham Place

Park Friends of Manor Park

Friends of Manor House

Gardens Friends of the Tarn

Friends of Keston Common

Friends of South Norwood Country

Park Friends of the Pool

Catchment Plan:

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FOR EVENTS ALONG THE RAVENSBOURNE PLEASE GO TO WWW.THAMES21.ORG.UK

Catchment Plan Production Thanks

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