Living with Rainwater

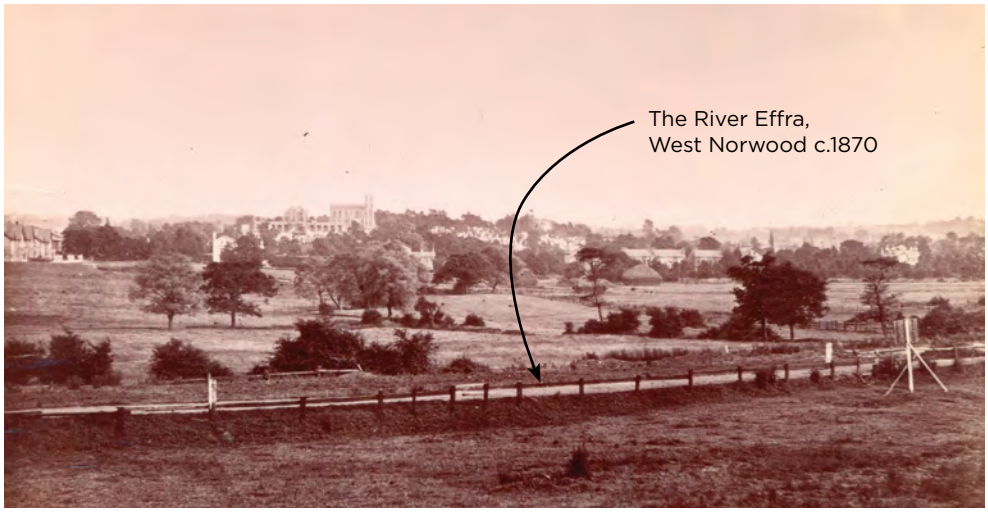
A guide to working with nature to make your neighbourhood more flood proof

5 Simple ways to reduce local flood risk

London Wildlife Trust

Protecting London's wildlife for the future

Welcome



Although they can feel increasingly disconnected, cities and the natural environment don't have to be separate. London was built around a network of rivers, many of which have since been pushed underground by our thirst for urban development and growth. However by working with nature to restore water's natural flow that is often lost in cities, we can create resilience to extreme weather as well as providing beautiful spaces for people to enjoy and where wildlife can flourish. This guide gives an introduction to small scale projects that can do just this.

The Lost Effra Project

Led by London Wildlife Trust, the Lost Effra project is working with communities in Herne Hill and the surrounding area to promote practical ways of working with water and nature to prevent flooding. Find out more and say hello on Twitter *@LostEffra* or by emailing Helen Spring, Lost Effra Project Coordinator at *hspring@wildlondon.org.uk*.

London Wildlife Trust ©2014

Rainwater runs through Brockwell Park

Inside

p.4-5
Our forgotten river and its secret legacy

p.6-7
Discover rain gardens

p.8-9
Transforming grey into green with living roofs

p.10-11
Reconnecting rainwater with the city through depaving

p.12-13
Be water savvy with cheap water butts

p.14-15
Meet local champions and get top tips for starting your own project

Rising Damp

by U.A. Fanthorpe

At our feet they lie low,
The little fervent underground
Rivers of London
Effra, Graveney, Falcon, Quaggy,
Wandle, Walbrook, Tyburn, Fleet
Whose names are disfigured,
Frayed, effaced.
There are the Magogs that chewed the clay
To the basin that London nestles in.
These are the currents that chiselled the city,
That washed the clothes and turned the mills,
Where children drank and salmon swam
And wells were holy.
They have gone under.
Boxed, like the magician's assistant.
Buried alive in earth.
Forgotten, like the dead.
They return spectrally after heavy rain,
Confounding suburban gardens. They inflitrate
Chronic bronchitis statistics. A silken
Slur haunts dwellings by shrouded
Watercourses, and is taken
For the footing of the dead.
Being of our world, they will return
(Westbourne, caged at Sloane Square,
Will jack from his box),
Will deluge cellars, detonate manholes,
Plant effluent on our faces,
Sink the city.
Effra, Graveney, Falcon, Quaggy,
Wandle, Walbrook, Tyburn, Fleet
It is the other rivers that lie
Lower, that touch us only in dreams
That never surface. We feel their tug
As a dowser's rod bends to the surface below
Phlegethon, Acheron, Lethe, Styx.

Editor and illustrations: Helen Spring
Design: Jonny Hughes (jonny2hughes@btinternet.com)

Many thanks to everyone in and around Herne Hill that contributed to the Lost Effra project so far; your actions, ideas and advice has made the project what it is today.

London Wildlife Trust is the only charity dedicated solely to protecting the capital's wildlife and wild spaces, engaging London's diverse communities through access to our nature reserves, campaigning, volunteering and education.

www.wildlondon.org.uk

Registered charity number 283895

What's the problem?

The forgotten River Effra

The suppression of one of London's great rivers is little known to most dwelling on its former banks. 150 years ago, the river Effra flowed from Norwood and Dulwich through Herne Hill and Brixton before curving around Oval and joining the Thames at Vauxhall. In a time of rapid Victorian development, the Effra became increasingly polluted and was heralded a health hazard. The chosen solution was to confine it within the new sewer system, but this was not the final mark that the Effra was to make on London's landscape.

painting by MH Mellor

Herne Hill under water

Lost rivers have a desire to return. Memorably in April 2004 the waters of the Effra dramatically flooded Herne Hill as 10cm of rain fell in just half an hour sending the sewers erupting into shops and homes. These desperate scenes were repeated again in August 2013, when a burst water main exposed the same area's vulnerability to flooding, covering the area once more in just 10 minutes.

Photo by Winch

Herne Hill's ability to flood can be put down to three main factors:

1. The River Effra formed the landscape, creating valleys that rainwater will run to and increasing flood risk in these areas.
2. The sewer system underneath the area is already fuller than it would otherwise be due to the 'Effra water' that drains from the surrounding area, before any of the water from our homes, schools and businesses gets there.
3. The loss of green space in favour of hard surfaces means rainwater cannot soak into the ground but flows instead into the nearest drain, filling the overstretched sewers even further.

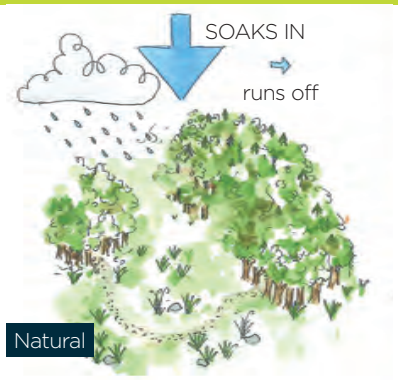
These factors make the area vulnerable to the extreme heavy rainfall events that we are experiencing more frequently in the UK as a result of climate change.

Solutions

The solution lies in turning our urban areas from grey to green by restoring the connection between rainwater and the river's natural path. With the Lost Effra project we are using direct and practical initiatives to ease the demand on London's dangerously overstretched drainage system. From putting a green roof on your shed to regreening your front garden, the following pages of this guide provide an introduction to these solutions and what you can do to reduce local flood risk.

Projects to increase plant cover and hold water where it falls can bring a huge range of benefits to our neighbourhoods...

- Local flood risk is reduced;
- Tolerance to drought is increased as more water is held at ground level;
- Water quality is improved as it is filtered by plants and bacteria;
- Valuable urban wildlife habitats are created increasing biodiversity;
- The urban heat island effect that causes London to be up to 9°C hotter than its surrounding areas



is reduced as plants cool the air around them;

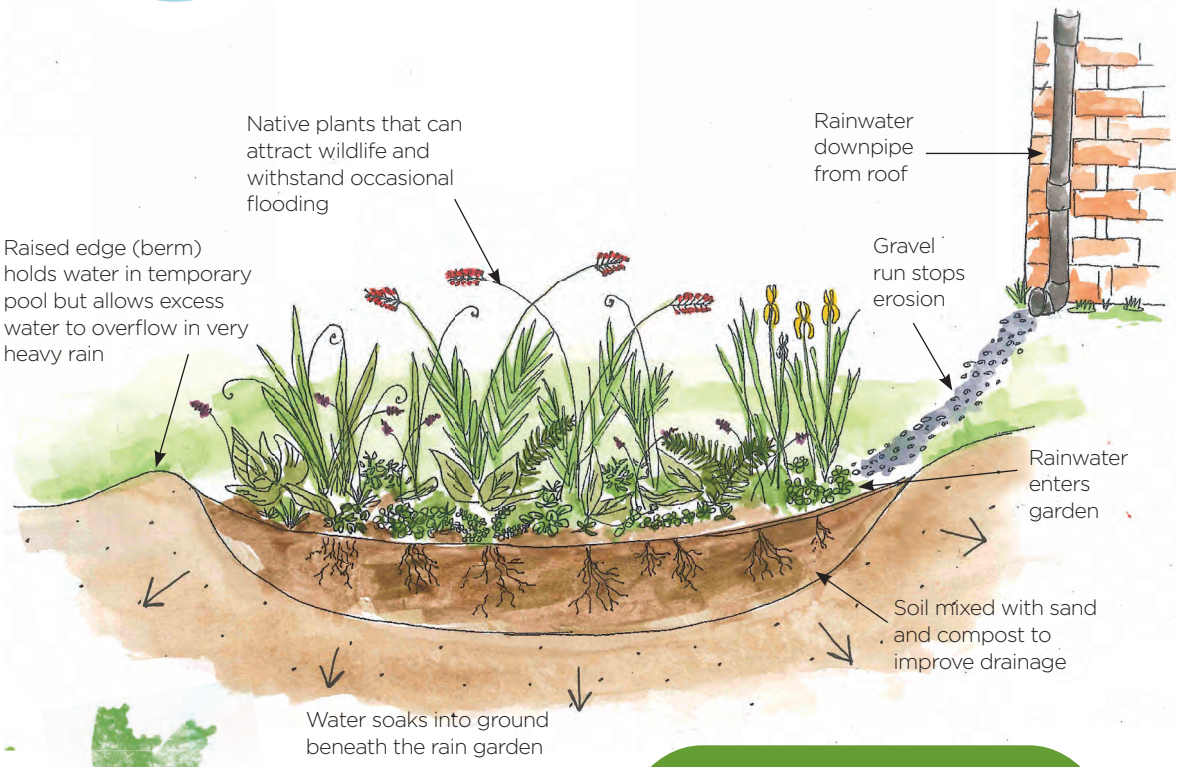
- Air quality can be improved as oxygen is produced and particles filtered out;
- They provide new outdoor places for us to enjoy and relax in;
- Increased access to nature improves people's wellbeing;
- Significantly cheaper than pipes, tunnels and hard engineering.

Rain gardens

divert rainwater from buildings and hard areas into wildlife havens

WHAT ARE THEY?

Rain gardens are shallow planted basins that allow water to drain naturally into the soil. When it rains, water that falls on hard surfaces like paving and rooftops can be diverted into rain gardens where it can soak into the ground or be absorbed by plant roots. Rain gardens provide simple, attractive and wildlife friendly ways to reduce flood risk and improve our urban areas.



TOP TIPS

01
Do an infiltration test before you build your garden to know whether you need to make the soil more permeable

02
Think about an overflow system so that your rain garden doesn't fill up more than you intend it to! There is plenty of advice at *raingardens.info*

03
Keep your rain garden 3m away from buildings to protect their foundations

FAQs

Useful resources
UK Rain Garden Guide at
raingardens.info

What's the difference between a rain garden and a pond?
Ponds are full of water most of the time, whereas rain gardens are usually dry. They can tolerate occasional spells of flooding but this usually drains away a few hours after a storm.

Will it attract mosquitoes?
No – mosquitoes need standing water for over a week to successfully reproduce, whereas a rain garden will only contain water for a few hours following most storms.

Are they expensive?
No - they are no more expensive than planting in other areas of your garden! The biggest cost involved is buying plants but you can save money by splitting plants that you already have in your garden or sharing new plants with friends and neighbours.

What can I plant in it?
You can really make it your own. It is a good idea to plant taller plants at the centre of the garden with a variety of species to create dense and resilient planting. Planting native species that are nectar rich will encourage bees and other pollinators into your garden, but avoid plants that are better suited to dry conditions such as lavender or those susceptible to root rot.

What about maintenance?
The only maintenance that rain gardens need is occasional weeding, and watering in dry weather when the garden is first planted to allow the plants to become established – not a lot!

IN PRACTICE

Rain garden on the Cressingham Gardens Estate, SW2

At the top of Brockwell Park, on the Cressingham Gardens estate you'll find the biggest rain garden in Lambeth. The chain of three rain gardens, each found at the foot of a rainwater downpipe from the large residential block, hold water when it rains and stops the rainwater from flowing down the hill to the low ground that is at greater risk of flooding. It was the brainchild of Nicholas Greaves, a Cressingham resident and keen gardener. With a little help from rainwater gardening enthusiast Dave McCollum, the Lost Effra project and Lambeth Council, the area now holds back water and is a home for local wildlife and a beautiful addition to the pedestrian walkway - well worth a visit! It's a bigger and more technical garden (and therefore more pricey!) than one you might make yourself but is a brilliant example of what local communities can achieve.

Green roofs

plant cover on roofs to catch rainwater and create new wildlife habitats

WHAT ARE THEY?

Quite simply, green roofs are roof tops that have been deliberately covered in plants. They act as a sponge, soaking up the rain and also providing important wildlife habitat for pollinators and insects, supporting the birds that rely on them. They also help to cool urban areas and increase both air and water quality - an impressive CV!

Q: WHAT IS SEDUM?
A: Sedum is a low growing, evergreen plant - often on green roofs for it's drought tolerance

DID YOU KNOW? Intensive green roofs are essentially rooftop gardens, containing thick soil with plants and trees. Extensive roofs have much thinner soil and are not usually intended for public access

Types of green roof

LIGHTWEIGHT EXTENSIVE
– The simplest green roof type!
Planting: sedum
Value:
- Light and low maintenance
- Thinner soil layer = hold less water
- Support less wildlife

Cost: £

EXTENSIVE *– what we like!*
Planting: mixture of sedum and wild flowers
Value:
- Support more wildlife than sedum alone
- Deeper soil = holds more water
- Heavier and need occasional watering if very dry

Cost: ££

SEMI-INTENSIVE *– more like a garden than a green roof!*
Planting: mixed – ornamental planting, herbs and small shrubs
Value:
- Excellent wildlife habitats
- Hold a lot of rainwater
- Very heavy and complex to install
- Require routine maintenance

Cost: £££

Photos by E.Dronkert and Centre for neighborhood

FAQs

More information:
The DIY Small Scale Green Roof Guide is available at *greenrooftraining.com* for £17 and provides all you need to know to do it yourself 'Guides' section of *greenroofcentre.co.uk*

Can I green my roof?
There are a few things you need to think about before you can build your green roof. Firstly, you need to make sure the building will be strong enough to hold the extra weight of a green roof. Supports and reinforcements can be used to increase the loading weight of a roof. You also need to think about the roof's slope. Flat roofs and those with a slight slope are simplest to green but you can create green roofs on those that slope up to 45 degrees with a little more thought.

Do green roofs need watering?
In general they don't need watering and will bounce back from dry periods. Remember that you're dealing with nature - if grasses and flowers go brown in summer they will recover with rainfall, just like they would in a meadow or lawn! However if you'd rather it didn't go brown you can water your green roof easily by incorporating a simple irrigation system into its design.

Who can build a green roof?
It's up to you! There is a lot of help and information available about how to build your own green roof but there are also plenty of qualified installers that will happily do it for you, depending on your preference (and budget!).

IN PRACTICE

Green roof on a bike shed, SE24

Built: November 2014
Cost: £86

Having attended a DIY green roof workshop, Jonny Hughes was determined to build his own small scale green roof. Through buying the waterproof liner and protective textile layers from specialist supplier *butylproducts.co.uk* and collecting a range of wood from local skips and building projects, he was able to create this simple green roof. It's a great example of what you can do yourself and how to keep costs to a minimum! As the roof already had a slight slope, the only drainage needed was a strip of stones at the bottom edge with a lower side that allows water to overflow in very heavy rainfall. It shows how you can have fun with a green roof – have a go, make it your own and see what you can create.

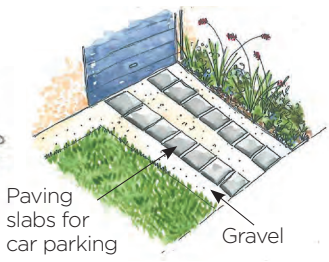
DID YOU KNOW?
Although green roofs are low maintenance they still need checking every once in a while to pull out any plants that you don't want up there and to make sure the gutters are clear. Have fun with them, throw up some seeds that you like the look of and see what happens!

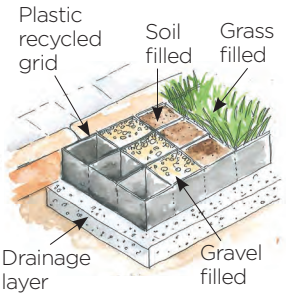
Depaving

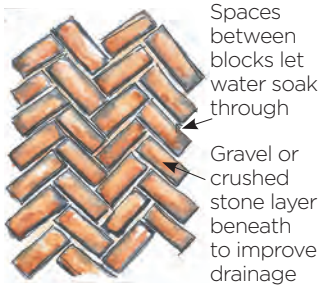
take up hard paving to allow water to soak through into the ground beneath

WHAT IS IT?

Depaving is the process of removing impermeable surfaces such as tarmac, concrete and paving slabs and replacing them with alternative materials that will allow water to pass through to the soil beneath, such as gravel, soil and grass. It can also be the process of getting rid of unnecessary tarmac to create new green spaces for people to enjoy and wildlife to thrive. It aims to counteract the problems caused by the mass-paving of London's urban gardens and can create not just permeability but attractive, healthy places for people to enjoy.







Gravel – in many ways the simplest and cheapest permeable surface! However it is prone to spreading and forming ruts so may need a little maintenance to keep it in the right place and isn't suitable for very steep driveways or wheelchairs.
Cost: from £3.75 per square metre (including delivery)

Wheel tracks – only pave the section that you actually need to drive on! Using planting and gravel in between wheel tracks is cheap, easy, attractive and better for wildlife.
Cost: about £5 per paving slab

Grass and gravel reinforcement – Using a grid of strong recycled plastic that can be driven over provides a permeable surface that grass and tough low growing plants can be grown through. Gravel can also be used for a low maintenance option.
Cost: Grassform Group from £19 per square metre; Netpave £16.50 per square metre

Brick pavers – looks like traditional block paving but gaps between bricks let water soak through to a layer of improved drainage below. Low maintenance but needs to be installed by a specialist contractor. Needs to be installed on compacted aggregate to allow water to soak through.
Cost: Marshall's Priora Pavers £16 per square metre; Formpave permeable pavers £18 per square metre

LAMBETH COUNCIL CAN HELP WITH YOUR DEPAVING PROJECT
As part of their plans to reduce flood risk in the Borough, Lambeth will provide homeowners with skips to remove waste from depaving free of charge. They will also provide compost to improve the ground that is uncovered and loan out tools when you're doing your depave project. They visit you early on to help with ideas and guidance.

To find out more, email *flooding@lambeth.gov.uk* or call 020 7926 0325.

DID YOU KNOW? Every year, an area of London two and a half times the size of Hyde Park is paved over in people's private gardens – a huge loss to London's wildlife and increasing the city's flood risk

MORE INFORMATION
Royal Horticultural Society guidance on permeable paving at *rhs.org.uk*
All about depaving at *depave.org*

How to depave - step by step

Although it is a relatively straightforward process, it is important to have a plan when conducting a depave project.

The steps below provide a framework for how to depave:

1. Make sure you know the whereabouts of pipes and cables before you start digging
2. Consider how rainwater naturally flows in the area in order to avoid soil erosion and messy runoff when it rains
3. Suit tools to the thickness of the surface that is being removed – choose either manual or mechanical
4. Remove waste and arrange for its removal and recycling or disposal
5. Once the area is clear, lay your chosen materials (gravel etc.) or if using the area for planting add compost with lots of organic matter
6. Finish as you wish (e.g. planting, sow grass seed, create vegetable patch)

IN PRACTICE

Depaving a front garden, Guernsey Grove, SE24

This small scale depaving project is a brilliant example of what you can do in your front garden to make your neighbourhood more resilient to flooding. Claire McDonald decided that she wanted to take up the ugly and impermeable crazy paving in her front garden and create an area to plant in its place. She drafted in some help from Lambeth's Community Freshview team who helped take up the tarmac, provided a skip and helped with other projects to green up the street – all free of charge to the residents! Now it's a permeable area, planted with shrubs and covered with mulch to keep the weeds at bay – inspiration for you to do it too…

Water butts

stop clean water from being lost to the sewers and protect water resources at the same time

One of the easiest things to do to help your neighbourhood become more flood proof is to fit a water butt. They work by storing the rainwater that falls on buildings which you can reuse to water the garden, wash the car or clean your windows.

Advantages

- Reusing rainwater reduces pressure on precious water resources, especially in areas of water stress such as South East England.
- Having a water butt can save you considerable amounts of money on your water bills, especially in summer when water consumption in the garden can rise to 50% of household use.
- Biologically, rainwater is better for plants than chemically treated household water so they'll thank you for it too.

They're both buy one get one half price from *savewater.co.uk*

100 litre water butt - good for fitting into a tight corner if you're short on space. Available from *savewater.co.uk* - reduced price £19.95.

DID YOU KNOW?
By installing a water butt you could also cut your carbon footprint as each household has half a tonne of water treated and pumped to their door every day! (Waterwise)

190 litre water butts - the most popular size – online reduced price £37.35.

FAQs

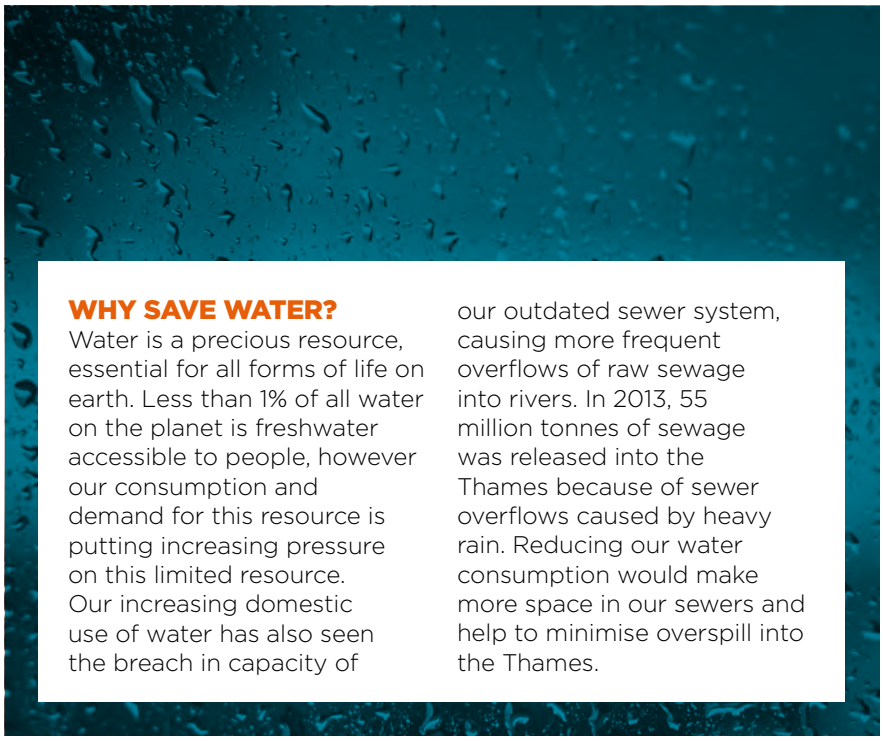
What about mosquitoes?
Some people encounter problems with mosquitoes breeding in their water butts but it can be easily stopped by adding a thin layer of vegetable oil onto the water's surface to stop them from laying eggs.

Are they easy to fit?
There are two ways of fitting water butts, either to cut the downpipe and place the water butt directly beneath it or to cut a notch out of the downpipe and use a diverter to carry the water from the pipe to the water butt whilst allowing you to place the tank where you wish. For more information see the water butt page of *waterwise.org.uk.*

Do they need to be maintained?
Water butts should be covered with a solid top or fine mesh to stop leaves and small animals from falling in. Occasionally you may need to empty your water butt to prevent algae growing but generally maintenance is minimal.

MORE INFO:
Where to buy them and fitting guide at *waterwise.org.uk/pages/water-butts*
Shop with discounts at *waterwise.savewater.co.uk*

Water efficiency



WHY SAVE WATER?

Water is a precious resource, essential for all forms of life on earth. Less than 1% of all water on the planet is freshwater accessible to people, however our consumption and demand for this resource is putting increasing pressure on this limited resource. Our increasing domestic use of water has also seen the breach in capacity of our outdated sewer system, causing more frequent overflows of raw sewage into rivers. In 2013, 55 million tonnes of sewage was released into the Thames because of sewer overflows caused by heavy rain. Reducing our water consumption would make more space in our sewers and help to minimise overspill into the Thames.

DID YOU KNOW? We only see about 3% of all of the water that we use - the rest is used to grow our food, make our clothes and process fuel for our transport

From shower heads and tap aerators to soil gel and shower timers, claim your FREE water saving gadgets at *freebies.thameswater.co.uk*

WATER SAVING IDEAS

Saving water around the home, at school and at work doesn't have to mean restricting the amount of water that you use, just minimising the amount that you waste...

In the house

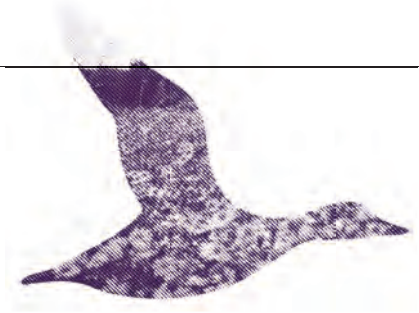
- Take short showers – ideally around four minutes! If you shower for more than 10 minutes you'd be better off having a bath;
- A third of the water we use at home is flushed down the loo - dual flush toilets and flush bags in the cistern help cut this amount;
- Keep a bottle or jug of water in the fridge rather than waiting for it to run cold from the tap;
- Wash muddy vegetables in a bowl of water rather than under a running tap;
- Check your home for leaks – a dripping tap can waste 60 litres of water a week – enough to fill a small bath;
- Fully load your washing machine and dishwasher – one full load uses half the amount of water as two smaller loads;

In the garden

- Fitting a water butt can collect enough water to fill 500 watering cans a year;
- Water plants in the early morning or evening to minimise the amount of water that is lost through evaporation;
- Use bark or pebbles to keep moisture in the soil This can reduce evaporation by up to 75%;
- Use a watering can rather than a hose.

Green rooftops in the heart of Herne Hill

Combating climate change through large scale community greening



There's a network out there of community minded people who are trying to bring about positive change and it's a great thing to be a part of.

The Urban Wild Project was started by Katy Obregon and Caroline Noble, two ambitious and green-minded locals that have embarked on an innovative eco-project to turn a row of 23 drab rooftops along Norwood Road from grey to green. The 'Herne Hill Highline', following in New York's steps will be the biggest green roof project on existing buildings and put Herne Hill on the map for urban greening!

We asked them for some advice that they'd give to others that wanted to start their own community greening project…

CN: I'd say nothing ventured nothing gained! Even if your idea seems too big or too difficult there's nothing to lose so just send that email or make that call… I have been constantly amazed by the people we've met; people who aren't cynical, who want to give something back and who are happy to help. There's a network out there of community minded people who are trying to bring about positive change and it's a great thing to be a part of

KO: Yes, if you have an idea and you are on your own, tap straight into what's already out there. I think if it's the natural world you want to protect you won't be alone for long. We've found it refreshingly easy to access expertise and support.

It has sometimes been difficult to promote the project as many people are unaware of how green roofs can benefit the community (and their pockets!) in terms of flood alleviation, clean air, energy savings etc. But once people have understood what we're doing, we've had an overwhelmingly positive response.

My advice? Let your love for the planet drive you and enjoy the ride!

Hints & tips

FUNDING

- Funding is available for a huge range of community projects including creating rain gardens, green roofs and making new green spaces in communal areas. You can apply as a community group, residents' association or you can start up your own group for a project.
- Once you've decided what to apply for, you can see what grants are available . Many organisation fund community projects:
  - *Big Lottery Fund*
  - *Biffa*
  - *Veolia Communities Fund*
  - *Mayor of London*
- It's good to be specific about what you need it for – you are more likely to be given funding if you can show how you will spend it.
- Don't be disheartened if you don't get the first grant that you apply for – it pays to try a few different funders.
- Finally, plan ahead so that you'll be ready if you receive the grant. – if you've got a good idea and a way of making it happen, there's no reason why you shouldn't get funding for it!

PLANNING PERMISSION

- Generally speaking you won't need planning permission for any of the projects mentioned in this guide unless they are going to significantly alter a structure that they are on. If you're unsure check with your local authority.

WILDLIFE GARDENING

- By making a few simple considerations in your project, you can make a big difference for the wildlife that it can support – bees, butterflies, bats and hedgehogs – projects in your garden can really help!
- In general, choose native plants – they often support our insects, birds and mammals better than those that have been introduced from overseas.
- Choose plants to attract nectar seeking bugs – ox-eye daisy, foxgloves and cornflowers are all fairly easy to grow.
- Make some shelters – a small log pile, some stones or a patch of long grass all provide safe places for wildlife to make a home.
- Keep away from pesticides, they can harm other animals, not just the pests you use them on.

LIVING WITH RAINWATER PROJECTS AROUND HERNE HILL

LOUGHBOROUGH FARM

LOUGHBOROUGH JUNCTION ACTION GROUP TOGETHER

LOUGHBOROUGH JUNCTION

Southwell Road Depave

BRIXTON

HERNE HILL

THE URBAN WILD PROJECT

Herne Hill Highline Green Roofs

London Wildlife Trust

Cressingham Rain Gardens

TULSE HILL

Rosendale Allotments Association

Rosendale Allotments Depave

DULWICH

Produced by the London Wildlife Trust. Based upon the Ordnance Survey 1: 10 000 map with the permission of The Controller of Her Majesty's Stationery Office. © Crown Copyright, All rights reserved. Licence No. AL100023493