Catchment report 2015

www.wessexwater.co.uk

a YTL company

Introduction

Welcome to the first edition of our annual catchment report.

In the past water authorities organised themselves according to river catchments and often controlled land use around water sources to prevent contamination of groundwater. However, after privatisation the focus shifted to upgrading water and sewage treatment infrastructure to provide greater guarantees that drinking water and effluent standards would be met within short timescales.

While major improvements were made to the quality of our drinking water and treated effluent, they came at a high price in terms of capital and operational costs such as additional treatment chemicals and an increased carbon footprint, due to the energy used. More recently, there has been an upsurge in interest in catchment management as a less resource-intensive way to protect groundwater, streams and rivers.

Since 2005 we have been carrying out catchment work in cooperation with farmers to optimise nutrient and pesticide inputs to land. This often means dealing with the causes of problems by looking at land use, management practices and even the behaviour of individuals. Addressing the issue at source is much more sustainable than investing in additional water treatment that is expensive to build and operate and leaves the problem in the environment.

At the same time we have been amassing data on the condition of the rivers and estuaries in our region to ensure that any subsequent investment is proportional and based on solid evidence. We have also been working on different ways to engage with the public and influence behaviour to help protect water supplies and sewers and, in turn, the water environment.

This report will give an overview of our environmental work each year, catchment-by-catchment. We hope you find it informative and look forward to any feedback you may have.

David Elliott

Director of Strategy and New Markets

Foreword

For 25 years, Wessex Water has invested heavily in the sewerage and water supply infrastructure needed to help meet the quality standards required for our rivers and bathing waters.

In 15 years working for the regulator responsible for overseeing Wessex Water's environmental performance, I saw not only the resultant improvements in water quality and river flow, but also a progressive change in the company's focus. Not content with just regulatory compliance, they wanted to achieve improvements and protection of the wider water environment in a more sustainable and cost-effective way. It was also clear that tackling diffuse pollution required more attention, and that capital investment to further improve point-source discharges was becoming disproportionately expensive. The scale of environmental quality improvements required undoubtedly needs action on both diffuse and point-source pollution, but the balance of investment and overall benefits has to be considered for each catchment as a whole.

Wessex Water pioneered working with landowners and farmers to achieve water quality improvements through changes to land management. This catchment-based approach is more cost effective than traditional treatment and delivers wider benefits for the water environment. It is now an important part of their programme for 2015-20, alongside investment in physical assets and environmental investigations aimed at better targeted future investment. The success of this investment programme will be independently scrutinised by the newly-formed Wessex Water Catchment Panel.

Many organisations and individuals have a role to play in addressing the activities that are still adversely affecting the quality of our water environment. It is good to see Wessex Water playing a significant role in each of the catchment steering groups set up to help coordinate and support this work.

This is the first annual catchment report. It provides details of progress so far and what is planned for the future in each of the catchments. I am sure it will be welcomed by all those already playing their part and will hopefully encourage others to join in.

We will all achieve more by working in partnership.

Dr Richard Cresswell MBE

Chair, Wessex Water Catchment Panel

Environmental investment: 1990-2010

Following decades of under investment, the first 10 years after privatisation saw extensive capital expenditure to meet European directives for the water environment, including those concerned with urban waste water treatment, habitats and birds, freshwater fish, shellfish waters, bathing water and groundwater.

Initially, the focus was on pollutants such as biochemical oxygen demand, ammonia and suspended solids. This led to widespread installation or upgrading of secondary treatment at sewage treatment works, the addition of tertiary disinfection of effluent at sites in the vicinity of bathing waters and upgrading of sludge treatment facilities.

There was also extensive surveying of flows and ecology in rivers at risk of low flows during dry conditions. Subsequent reviews of abstraction licences resulted in reduced daily abstraction limits amounting to 20 megalitres per day (with a further 25 megalitres per day reduction by 2018).

Regulated investment in the 2000s began to tackle nutrient enrichment, which in warm weather can cause algal blooms that deoxygenate rivers and estuaries. Consequently, phosphorus removal is now commonplace at inland sewage treatment works.

This remains one of the main areas of concern for the water environment in our region, although it is recognised that nutrient inputs are now dominated by diffuse sources, rather than single points such as sewage treatment works discharges.

This period also saw the start of concerted efforts to tackle groundwater pollution at source through catchment management.

	1990	2000	2010
Water into the supply network (megalitres/day)	423	373	340
Population served by two or more stages of sewage treatment	62%	97%	100%
Biochemical oxygen demand removed	83%	89%	95%
Coastal sewage treatment works with disinfection	0	7	18
Sewage treatment works with phosphorus removal	0	2	39

This period saw the start of concerted efforts to tackle groundwater pollution at source through catchment management.

Environmental investment: 2010-2015

Our investment programme is becoming more diverse in terms of the methods we use.

Our integrated water supply grid project began in 2012. A multi-purpose scheme, it will allow us to reduce abstraction from boreholes thought to affect river flows, as well as increasing security of water supply, increasing the flexibility of the supply network and reducing the need for additional water treatment to deal with nitrates and pesticides.

Other conventional asset-based improvements included upgrades at Weston-super-Mare to improve local bathing beaches, and at Taunton sewage treatment works to improve the River Tone. And with advanced anaerobic digestion installed at Bristol sewage treatment works, the volume of biogas which is used to generate renewable energy increased by 50% as a result.

We extended our catchment management work for protecting drinking water sources to further locations and took on the leadership of two multi-agency projects for two river catchments.

During this period we had a larger programme of environmental investigations, covering:

- the relationship between our assets and water quality at three Somerset beaches and in Poole Harbour shellfishery
- the potential for phosphorus removal with reedbeds
- the prevalence of emerging micro-pollutants in sewage.

Previous progress in reducing the number of pollution incidents was the result of better monitoring and incident management. As the majority are now caused by sewer blockages, we have also been working to raise public awareness of problems caused by wet wipes flushed down toilets and fat, oil and grease disposed of down kitchen sinks.

Behavioural interventions like these are now part of a wider portfolio of approaches, alongside investment in physical assets, catchment management and environmental investigations.

Our investment programme is becoming more diverse in terms of the methods we use.

photo – Julian Wardlaw

The Stour at Blandford

Environmental investment: 2015-2020

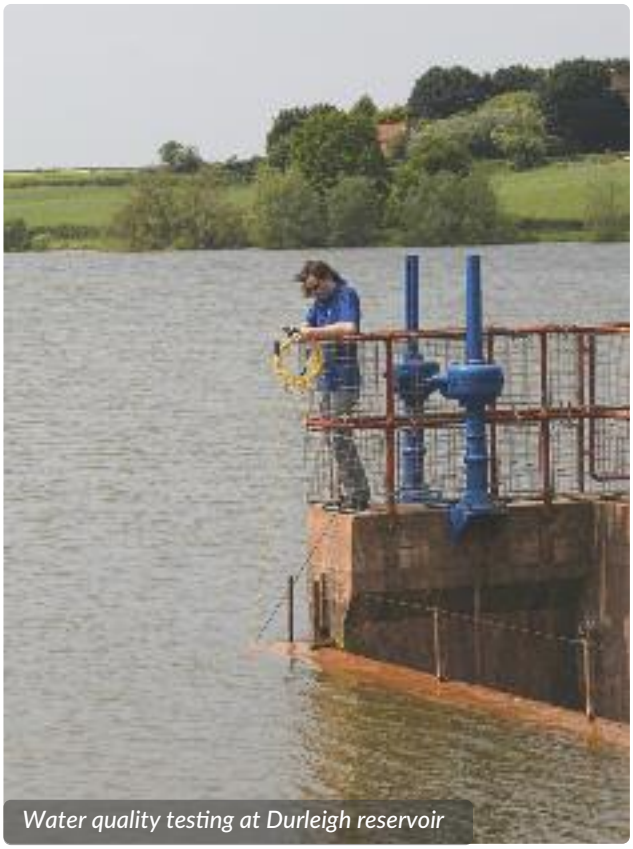
2015-20 outcomes, targets and indicators

Our investment over the next five years will be guided by a set of social and environmental outcomes that we defined for our business plan, following consultation with customers and other stakeholders.

Three of the outcomes related to environmental topics covered by this report are protection of rivers, lakes and estuaries, improved bathing water and reduced carbon footprint. The outcomes for each are expressed as follows:

- watercourses in good ecological and chemical condition with abstractions, effluent and land runoff sustainably accommodated by the environment
- contributing to bathing water being in good or excellent condition
- achieving carbon neutrality in the long term and generating more of our own renewable energy.

Each outcome has associated measures of success that will be used for tracking progress over the next five years. These are shown in the table below:



Water quality testing at Durleigh reservoir

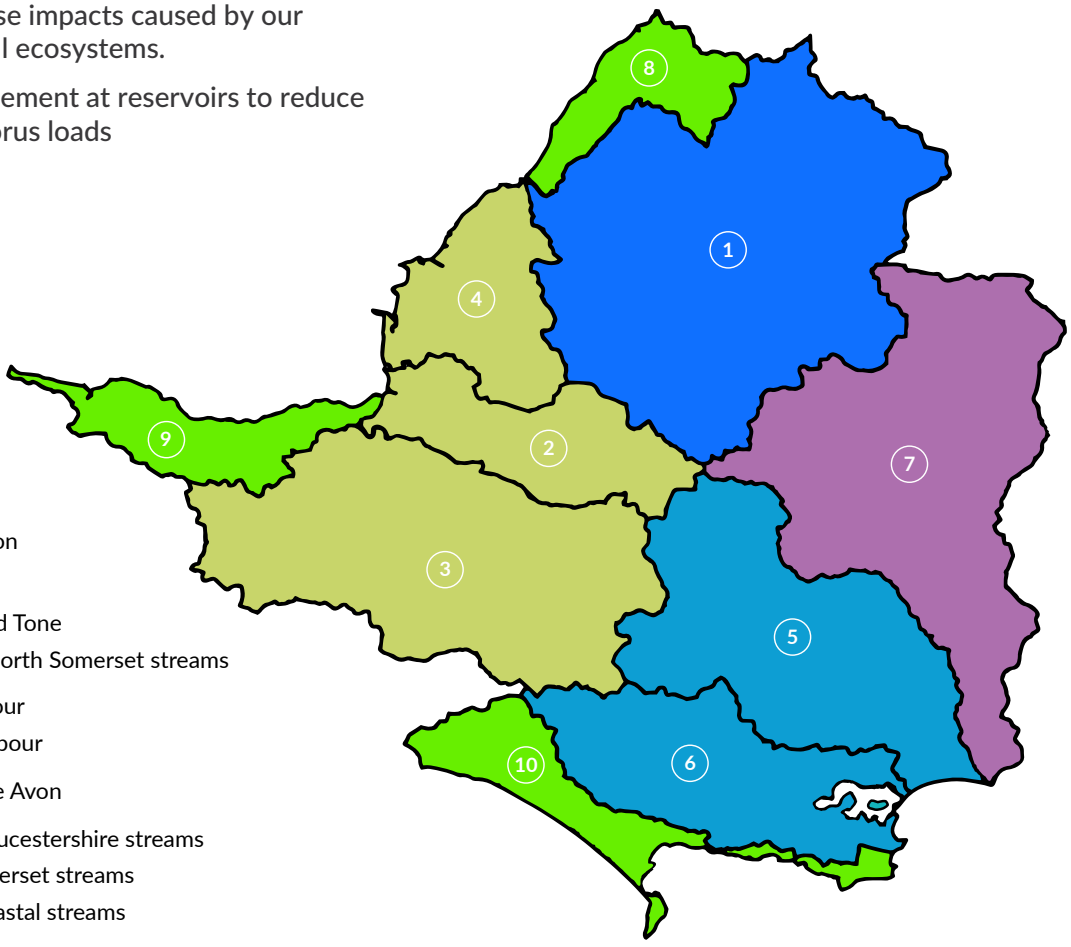
	Current	By 2020
Rivers, streams and estuaries protected		
EA performance assessment	Above average	Industry leading
Compliance with our abstraction licences	100%	100%
Abstractions at Mere exported	447 Ml / a	100 Ml/a
Length of river with improved flow	-	99km
Improving river water quality	-	70 waterbodies
Monitoring our combined sewer overflows	33%	100%
Actively assessing and managing biodiversity on all our sites	47%	100%
Improved bathing water		
Agreed schemes delivered	100%	100%
Beaches passing EU bathing standards	100%	100%
Reduced carbon footprint		
Greenhouse gas emissions	149 kt /a	119 kt /a
Proportion of energy self-generated	18%	24%

Asset investment, catchment work, behaviour, investigations

A wide range of activity is planned for 2015-20 to achieve the outcomes we have set ourselves. The activity is outlined below and explained in more detail in the following pages for each of the main catchments of our region.

- Completion of the integrated water supply grid in 2018.
- Work in the Burnham and Bridgwater areas to reduce the bacteriological load discharging into the bathing water at Burnham Jetty.
- Removal of phosphorus from effluent for the first time at 10 sewage treatment works, plus enhancement of existing phosphorus removal processes at 13 other sites as part of catchment-based consenting in the Bristol Avon.
- Improvements to sewage treatment to meet tighter ammonia standards at five sites
- A package of measures to be spread over more than one five-year investment cycle to achieve Water Framework Directive (WFD) standards, for locations where there is uncertainty about the scale of adverse impacts caused by our discharges on local ecosystems.
- Catchment management at reservoirs to reduce incoming phosphorus loads
- Catchment management upstream of Poole Harbour to reduce discharges of nitrogen from agricultural land, as an alternative to nitrogen removal at Dorchester and Wool sewage treatment works.
- Investigations of ecological status of reservoirs, pesticide risk for water sources, abstraction impacts on three watercourses, eel populations at water supply points, impacts on bathing and shellfish waters at five sites, new technologies for removing nutrients in effluent to very low levels, and pharmaceuticals and other new micro-pollutants in sewage (as part of the national investigation programme and in partnership with the University of Bath).
- Also with the University of Bath, trialling phosphorus removal with algae and carrying out further work with reedbeds for the same purpose.
- Improvements to sludge digestion at Berry Hill (near Bournemouth) and Taunton to increase biogas production and, as a result, renewable energy generation.

Catchments



1 Bristol Avon
2 Brue
3 Parrett and Tone
4 Axe and North Somerset streams
5 Dorset Stour
6 Poole Harbour
7 Hampshire Avon
8 South Gloucestershire streams
9 West Somerset streams
10 Dorset coastal streams

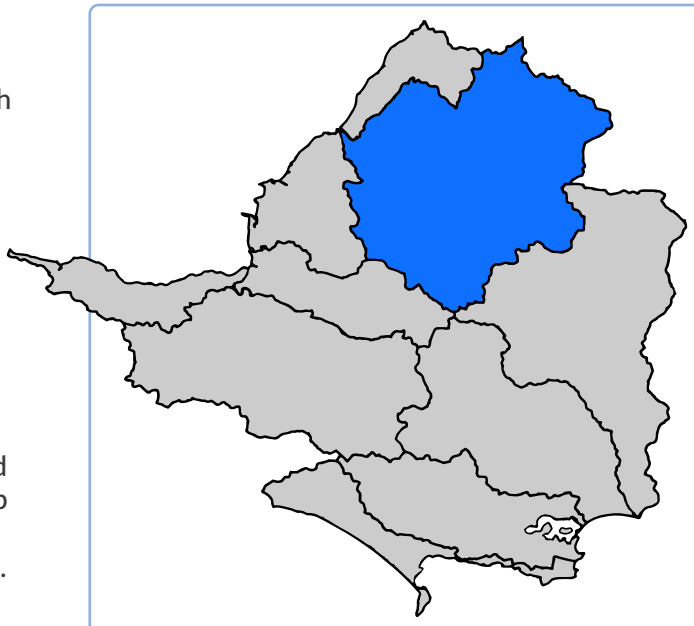
Bristol Avon

Water abstraction

Since the early 1990s we have been working with Bristol Water and the Environment Agency to improve river flows in the Malmesbury Avon, which was dry through Malmesbury during summers such as 1990 and 1995.

We have investigated the impacts of our abstractions in the Upper Avon catchment near Tetbury and Malmesbury for a number of years; Bristol Water also abstracts from the same aquifers. The solution involved Bristol Water reducing its abstraction licence by 10 Ml/day and Wessex Water by 4 Ml/d, while also providing up to 22.5 Ml/d of additional stream support from boreholes at Luckington, Stanbridge and Tetbury. This solution was implemented in 1995 and has successfully maintained acceptable river flows ever since.

In terms of water supply quality within the catchment, concentrations of nitrate in groundwater have plateaued at a level which does not affect drinking water abstractions.

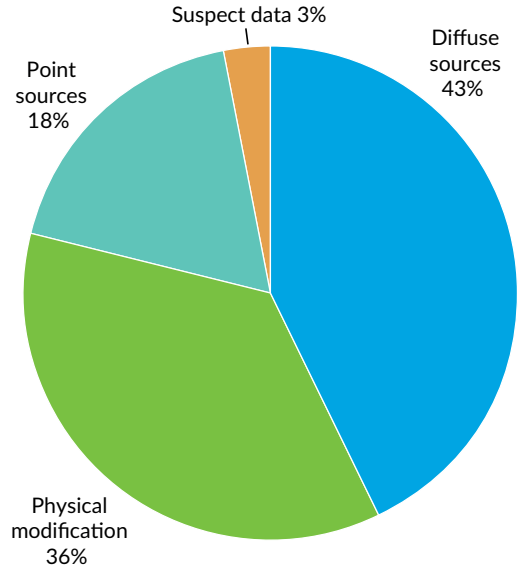


Sewage treatment impacts

Only 20% of the waterbodies within the catchment achieve good or high status under the WFD, with the majority (44%) at moderate status. The main water quality issue within this catchment relates to phosphorus concentrations. Environment Agency modelling suggests that 57% of the phosphorus discharges within the catchment are from point sources such as sewage treatment works, with 43% from diffuse, including rural and urban sources.

Since 2005 we have installed phosphorus removal at 18 sewage treatment works in this catchment to improve river water quality, using ferric sulphate to precipitate out the phosphorus. We have also improved more than 40 intermittent overflows within Bristol to improve storm discharges.

Reasons for not achieving WFD status Bristol Avon



Source: EA Catchment information pack

Other activity

Our plans for 2015-20 include a number of innovative solutions for sewage treatment works including:

- catchment-wide permitting covering more than 20 sites
- BioMag phosphorus removal technology at Bowerhill
- steel slag reedbeds at Devizes
- an algal pond at Beckington and a constructed wetland at Cromhall, both for the purpose of removing phosphorus from effluent.

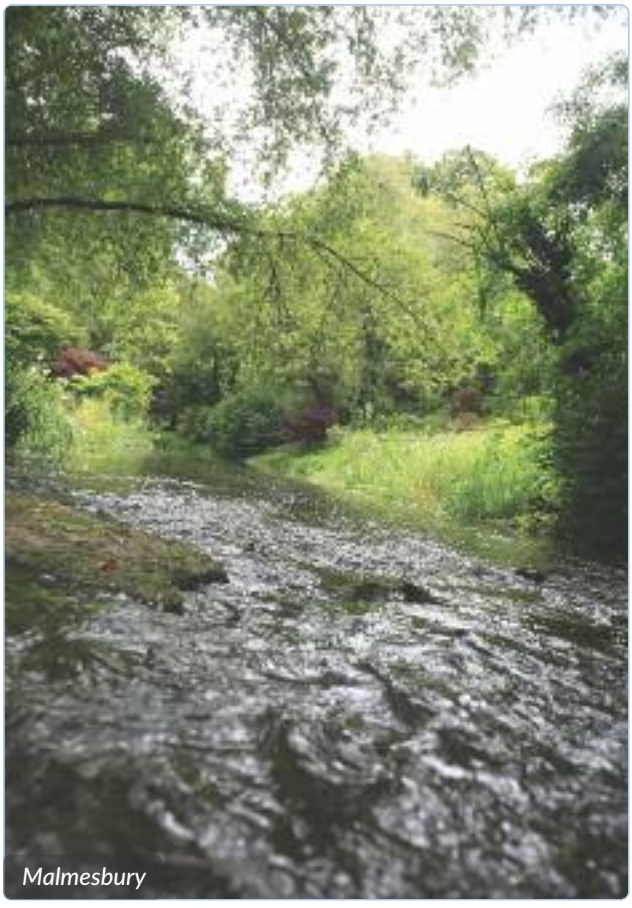
Additionally, we are investigating the presence of priority and emerging chemicals at eight STWs across the catchment and the impact of Wick St Lawrence sewage treatment works on nearby bathing water.

The sludge generated from sewage treatment in this catchment is mainly treated by anaerobic digestion; at Bristol sewage treatment works we also process food waste in this way.

In this catchment our Biodiversity Action Plan partners programme is supporting Avon Wildlife Trust's North Somerset levels and moors floodplain and coastal grazing marsh project. This is identifying habitat condition and working with landowners to promote biodiversity and protect the water environment.

Diffuse impacts

Our Streamclean team works in the Bristol area identifying misconnections of foul sewers to surface water drains. For several years this was carried out by a team jointly funded by the Environment Agency, Wessex Water and Bristol City Council and when this team was disbanded in 2014 we took on the scheme. Working with the local authorities has been very successful and as a result there has been a reduction in the number of misconnections and an improvement in water quality in local watercourses.



Malmesbury

Wick

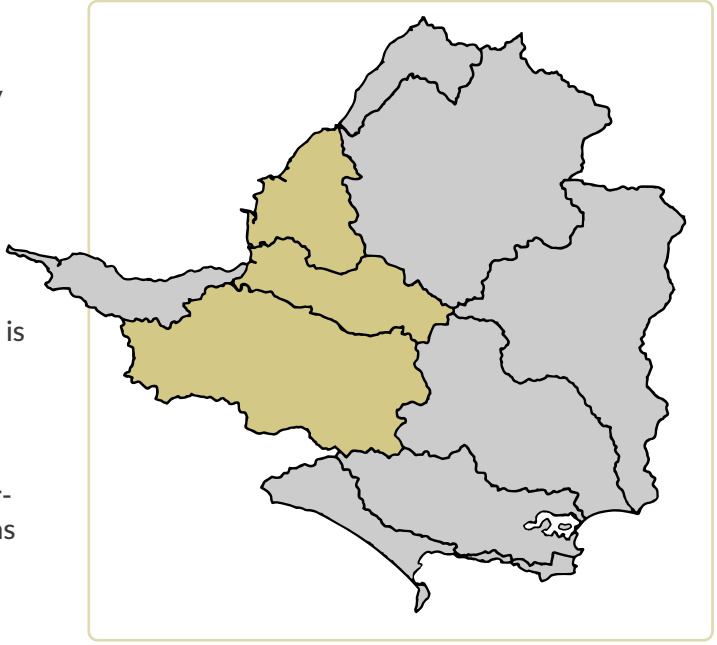
Since 2005 we have installed phosphorus removal at 18 sewage treatment works in this catchment to improve river water quality.

Bowerhill

Reedbeds at Devizes

Brue, Parrett, Tone and Axe

Point source work



Two bathing waters in this area at Burnham Jetty and Weston-super-Mare Uphill are in danger of not meeting the revised EU Bathing Water Directive, which could result in their closure for bathing. The reasons for this involve both point source and diffuse inputs and we have investigated the degree to which the bacteriological condition of these bathing waters is affected by our assets.

As a result, we spent £26m in 2013 to improve secondary treatment, stormwater storage and disinfection of the final effluent at Weston-super-Mare sewage treatment works. Our investigations also indicated where overflow spills from sewers near Bridgwater occur frequently or in sufficient volume to affect bathing water quality.

During 2015-20 we will spend £39m on improvements to six combined sewer overflows, reducing spill frequency to around four times per year and halving the volume. Ultraviolet disinfection will be provided at Cannington, Combwich and Highbridge. We will be using an innovative tracer survey to investigate the impact of the River Tone on Burnham Jetty bathing water.

We are installing phosphorus removal at Taunton and Wellington sewage treatment works in the next five years and will continue to study its removal via reedbeds in the area, together with the potential for more sustainable forms of removal at small sewage treatment works.

We spent £26m in 2013 to improve secondary treatment, stormwater storage and disinfection of the final effluent at Weston-super-Mare sewage treatment works.

Storm tanks at Weston-super-Mare sewage treatment works

Durleigh reservoir

Diffuse impacts

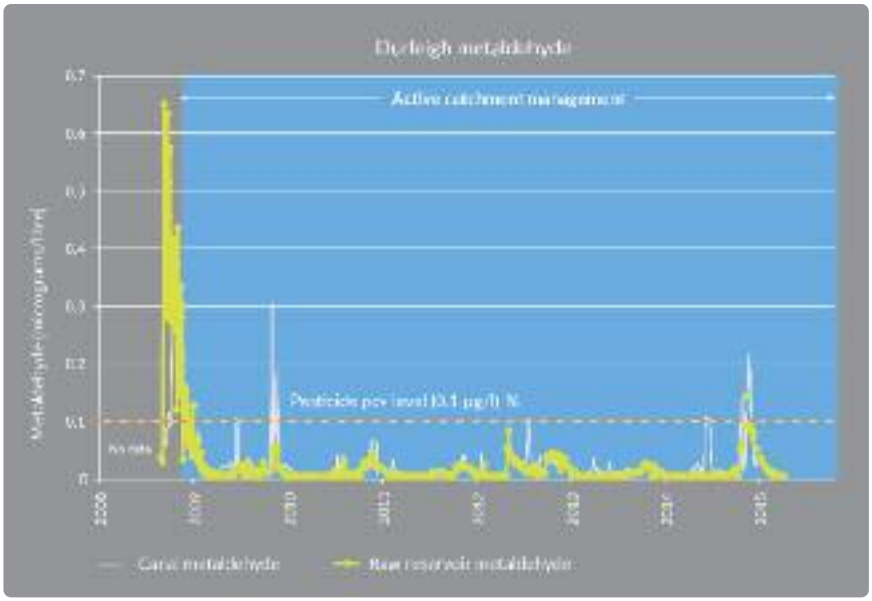
At Durleigh reservoir we have historically experienced contamination by the pesticide metaldehyde, which is commonly used in slug pellets and is resistant to water treatment. By educating landowners and farmers in the reservoir's catchment and offering grants to encourage farmers to switch to a non-metaldehyde alternative, we have reduced contamination risk to a very low level.

In association with our bathing water investigations we carried out microbial source tracking during 2010-2015, analysing the DNA of bacteria to determine whether it originated from humans or animals. This revealed higher cattle and sheep contributions in the Cannington Brook, the River Brue downstream of Westhay Bridge and some of the smaller watercourses flowing into the Parrett.

Our work in the area has also revealed a number of properties where foul sewers are misconnected to surface water drains. From autumn 2015, Wessex Water will be part funding a coastal projects officer to work with local communities and businesses, to highlight links between their activities and bathing water quality. This could encompass dog fouling and sewer misuse causing blockages, as well as local beach cleans.

We have worked with the local council and the local internal drainage board to help reduce pollution incidents caused by groundwater entering the private sewerage system at Brent Knoll, using a bespoke, pumped solution.

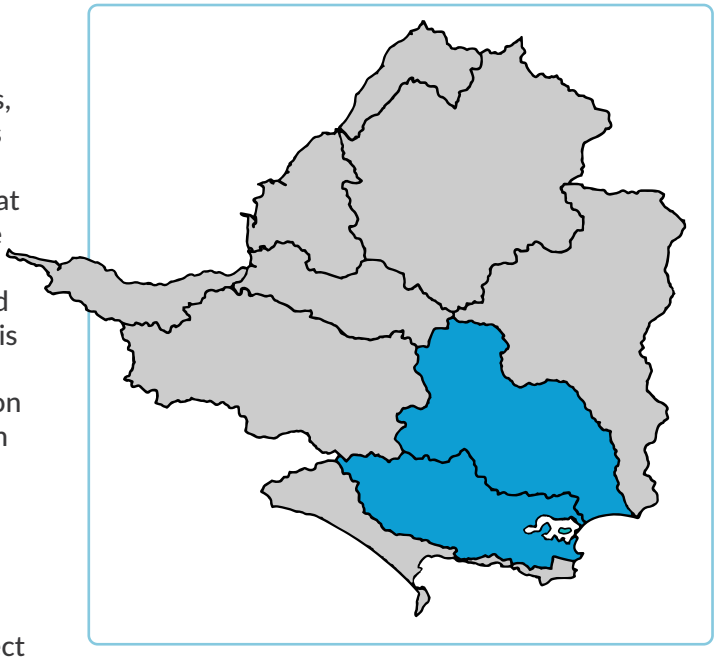
From autumn 2015, Wessex Water will be part funding a coastal projects officer to work with local communities and businesses...



Stour, Frome and Piddle, Poole Harbour

Water abstraction

Nitrate treatment is installed at Black Lane works, near Blandford, but our efforts in the catchments of our groundwater sources at Empool, Eagle Lodge, Hooke and Winterbourne Abbas mean that we have not had to install any treatment at these high risk nitrate sources, although the Winterbourne Abbas source has been mothballed due to water quality issues other than nitrate. This work will continue between 2015 and 2020 with the inclusion of the additional catchments of Alton Pancras, Forston, Milborne St Andrew and Sutton Poyntz.



Sewage treatment impacts

The main concern in these catchments is the effect of nutrients from point and diffuse sources. In the Frome catchment, phosphorus removal was installed between 2000 and 2005 at Dorchester, Wool and Wareham sewage treatment works, followed by the transfer of flows from Bradford Peverell to Dorchester and from Lulworth to Wool.

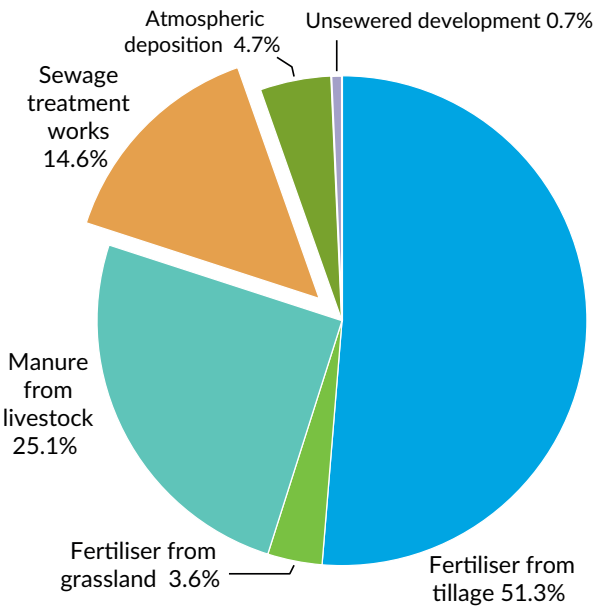
Around 750 tonnes of nitrogen is removed from effluent each year at Poole sewage treatment works, albeit with a high carbon and chemical cost, following investment in 2008. The nitrogen contribution from other treatment works in the catchment was considered at the time but deemed not to have an adverse impact on the Poole Harbour Special Protection Area. Nonetheless, during 2015-2020 we will carry out a nitrogen offsetting trial in the harbour's catchment to deliver a further reduction of 40 tonnes per year (see Diffuse impacts).

With the exception of Cranborne there is currently no phosphorus removal at treatment works in the Stour catchment. This is because no stretches of the river are designated as EU Natura 2000 sites, nor as sensitive areas under the Urban Waste Water Treatment Directive, which are the usual precursors for phosphorus removal.

Poole harbour

However, during 2015-20 we will install phosphorus removal at seven sites and undertake a catchment wide nutrient investigation. Christchurch Harbour does not achieve good status for nitrogen and there is a suspicion that nutrient loads from the Stour affect the nearby Solent Site of Special Scientific Interest and Special Area of Conservation. Further source apportionment investigations and options appraisal work will be carried out in the next few years to better understand this.

Sources of nitrogen in Poole Harbour



Diffuse impacts

Nitrate levels have been rising in the groundwater at our Sturminster Marshall and Shapwick sources, indicating the effects of agricultural practices over a number of decades in the Stour catchment. Otherwise, our catchment advisers continue to work with farmers across the area to try to halt the upward trend of nitrates in the groundwater (see Abstraction).

Our Streamclean initiative operates in the coastal towns in these catchments, proactively identifying misconnections of foul sewerage to surface water drains. This is done jointly with local authorities to reduce bacterial pollution of bathing waters.

Approximately 80% of the nitrogen and 77% of the phosphorus in the Poole Harbour catchment is from wider diffuse and non-sewered inputs; our monitoring and investigations indicate significant contributions of nutrients and other chemicals from agricultural sources. Consequently, we are carrying out a nitrogen offsetting trial during 2015-20 that will involve funding, and working closely with, the catchment's farmers to implement measures that will reduce nitrates entering the watercourse and reaching the harbour. In the Stour catchment, Environment Agency modelling suggests that diffuse sources are behind 56% of the reasons for waterbodies failing to achieve WFD good status, with point sources accounting for 21%. Other reasons for failure include physical modification, invasive non-native species and flows.

During 2015-20 we will install phosphorus removal at seven sites and undertake a catchment wide nutrient investigation.

Working with farmers

Other activity

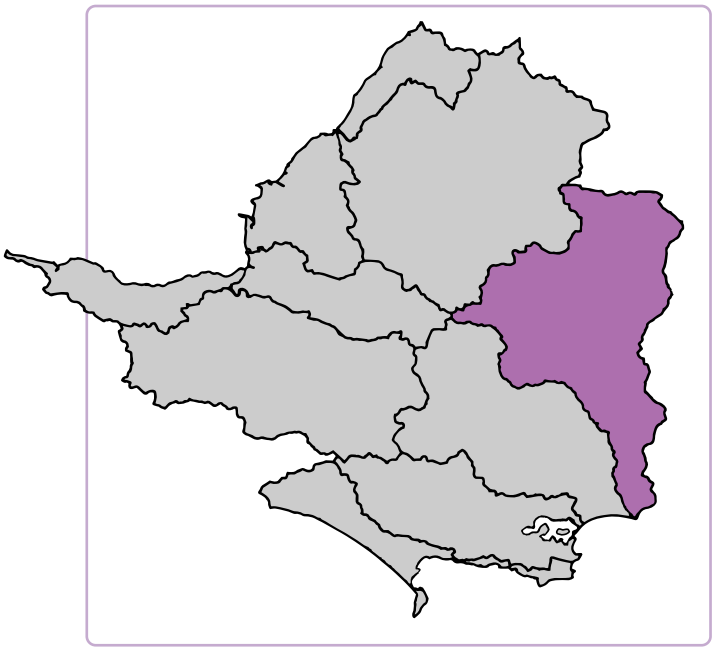
We are hosting the Poole Harbour Catchment Initiative and co-hosting the Stour Catchment Initiative with Dorset Wildlife Trust. These are partnerships of organisations actively engaged in delivering water quality and biodiversity improvements to achieve outcomes for the Water Framework Directive and England biodiversity strategy (Biodiversity 2020). We support other partnership projects in these catchments including Dorset Wild Rivers and the Litter Free Coast and Sea campaign.

Hampshire Avon

Water abstraction

We abstract water for public supply from chalk aquifers in upper parts of the catchment around Salisbury. The impact of this on the Hampshire Avon Natura 2000 site was the subject of a major low flow study during AMP4 (2005-10). Consequently, abstraction licences within the catchment will be reduced by 23.5Ml/day. These licence reductions are primarily enabled through the construction of our integrated water supply grid which will be completed in 2018.

We are also reducing abstractions at Upton Scudamore to increase river flow as part of the Restoring Sustainable Abstraction programme. Meanwhile, water quality monitoring over the decades indicates a rising nitrate trend at many of our sources. Our preference is to solve the problem at source rather than installing costly treatment solutions. Following our work with farmers in the vicinity of Chirton, Dunkerton and Wylye sources, nitrate



levels have stabilised and will not compromise compliance in the immediate future. During 2015-20 we will focus our efforts at Bulbridge, Deans Farm and Fonthill Bishop.

Sewage treatment impacts

Because of the nature conservation status of the Hampshire Avon, we invested more than £30m in phosphorus removal at 17 sewage treatment works between 2000 and 2010 and this has significantly reduced phosphorus inputs to the catchment and improved water quality.

Further investment means that by 2020 all our main sewage treatment works in the catchment will meet a total phosphorus standard of 1mg per litre. We will also optimise existing treatment at Warminster to understand what can be delivered by current technologies and move our discharge point from Westbury sewage treatment works to the River Biss, which offers better dilution than the current receiving water.

Upper Hampshire Avon

A major campaign took place in Salisbury to raise awareness of blockages caused by sewer misuse...

Diffuse impacts

Although we have significantly reduced our impact on the catchment, favourable condition for the Water Framework Directive (WFD) and Sites of Special Scientific Interest (SSSI) is not yet achieved, due to a range of other issues. Rural diffuse pollution, often linked to land management practices, undoubtedly contributes to elevated nitrogen and phosphorus levels. There are also thought to be locally significant contributions from unsewered hamlets and villages, although the level of this has not been well quantified, while fish farms and cress beds can also pass high levels of phosphorus to the river. The local geology, mainly a mix of chalk and upper greensand, may also have an impact. Water in upper greensand aquifers contains higher natural phosphorus levels than in chalk (in which phosphorus reacts with calcium). This could mean that there is a natural background contribution of phosphorus that holds back the attainment of WFD and SSSI standards. Further work is required to quantify this contribution.

In 2014-15 a major campaign took place in Salisbury to raise awareness of blockages caused by sewer misuse, in particular targeting the flushing of wet wipes down toilets. Around 1,200 customers made the pledge to flush only the three Ps – paper, poo and pee.

Other activity

Wessex Water has supported the Wessex Chalk Streams project since it was established in 1998. Its core aims of restoring riverine habitats have led to many kilometres of river being restored each year. We have also supported the South West Farmland Birds project based in Cranborne Chase Area of Outstanding Natural Beauty. This project involves agronomic advice and habitat and land management techniques that reduce or reverse the decline in farmland birds. This work has strongly complemented our water supply grid programme.

We are supporters of the Hampshire Avon catchment partnership, which is hosted by the Wessex Chalk and Rivers Trust, promoting projects to deliver Water Framework Directive and Biodiversity 2020 outcomes.

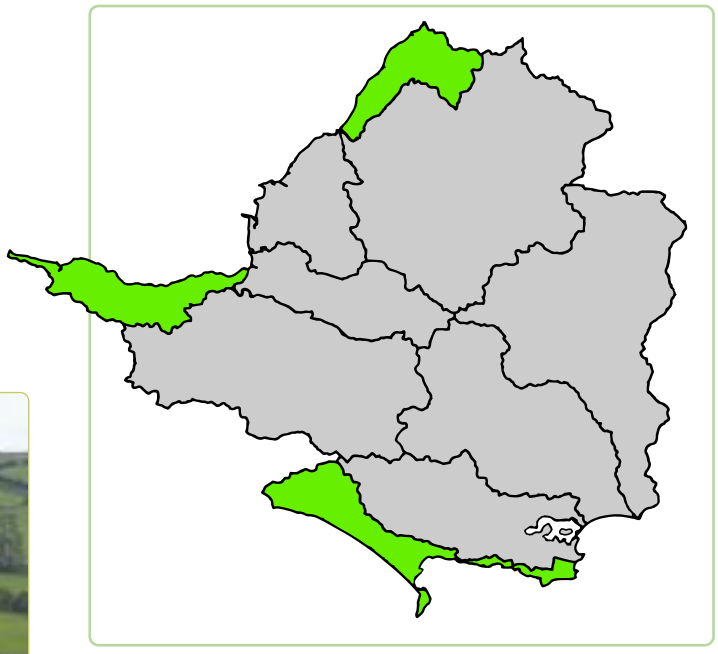
Tree sparrow, one of the target species of the South West Farmland Birds project,

photo – Andy Hay (rspb-images.com)

Smaller catchments

Water abstraction

Catchment management will be carried out during 2015-20 to reduce nitrates in our groundwater sources at Friar Waddon near the River Wey and Belhuish near the River Win, which are both within the Dorset coastal streams catchment.



Friar Waddon

Sewage treatment impacts

The Little Avon catchment in the north of our region has elevated phosphorus levels and we were recently involved with the Payments for Ecosystems Services (see Looking ahead, page 20) pilot project, funded by Defra and led by the Bristol Avon Rivers Trust, to find alternatives to conventional phosphorus reductions. The project found that a catchment-wide integrated constructed wetland would provide the most environmental, amenity, cost and social benefits. The next best option is a single constructed wetland downstream of Cromhall sewage treatment works to reduce nutrients and suspended solids in the effluent, benefiting the watercourse and a downstream fishery. We are committed to delivering the latter solution, in partnership with the Tortworth Estate.

In many other smaller catchments we lack sufficient data to fully assess the nutrient load in effluent from our sewage treatment works. So, during 2015-20 we plan to increase water quality data collection and improve modelling to understand the sources of the nutrients that contribute towards water bodies not meeting WFD objectives.

While it is likely that our effluent discharges have an impact, without a robust evidence base it is difficult to identify the best solution. However, at smaller sites there is more opportunity for creative solutions such as wetlands, reedbeds, or catchment management to offset or control nutrients at source, in partnership with other interests.

Diffuse impacts

Within Dorset and West Somerset there are many small coastal streams which flow into bathing waters and the sea. In some locations, such as Blue Anchor and the Fleet there are concerns that bacteriological levels may be elevated due to rural land practices and unsewered villages. These are considered to be 'flashy' catchments where the response to rainfall is quick, leading to high levels of runoff into the bathing waters and shellfisheries.

We will be looking at our sewage treatment works' contributions to the Fleet over the next few years to understand how our assets may affect the shellfishery. We have already investigated our assets in the Blue Anchor catchment and concluded that the main contributors are from agricultural sources. However, our investigations did highlight a number of misconnections which have now been rectified.

The risks to bathing waters and rivers from unsewered properties are difficult to assess. Within many of these smaller rural catchments there are private septic tanks and sewage treatment works which are not maintained by Wessex Water but are the responsibility of the homeowner. Locally, these can have a significant contribution to phosphorus and bacteriological loads in the environment.

These smaller catchments often lend themselves to more creative solutions such as wetlands, offsetting and payment for ecosystem services schemes.

Abbotsbury sewage treatment works

Oyster beds at Ferrybridge

We have already investigated our assets in the Blue Anchor catchment and concluded that the main contributors are from agricultural sources.

Blue Anchor

Biodiversity

Our landholdings

One of the key aims of our Biodiversity Action Plan is to halt or reverse biodiversity loss where it occurs on our land. To do this we assess our land for its biodiversity interest and manage it appropriately to meet our own standards and contribute to national targets.

The England Biodiversity Strategy (Biodiversity 2020) aims for at least 50% of Sites of Special Scientific Interest (SSSI) to be in favourable condition by 2020, with at least 95% in favourable or recovering condition. Of our land, 294 hectares (approximately one tenth) is designated as a SSSI and our careful management of these areas has resulted in 62% being in favourable condition and 37% in recovering condition.

Two biodiversity projects, which studied birds, bats and invertebrates on our most wildlife rich sites, reached their final year in 2014-15. In depth surveys have provided detailed information on how key species use these sites and the condition of the habitats there, resulting in detailed descriptions of 15 sites plus visitor interpretation, new or improved footpaths and a new bridge to allow us to reach an inaccessible area at a reservoir.

Our approach to managing our land is exemplified by our management of Clatworthy reservoir. Our birds, bats and invertebrate project there has resulted in habitat assessments and thousands of species records, allowing us to better focus wildlife management.

Other improvements include:

- a visitor counter
- new visitor signage
- habitat management by our rangers to maintain important grassland for butterflies
- extensive control of Himalayan balsam to prevent its spread downstream
- work with Historic England to reduce the number of trees on the banks of Clatworthy hill fort, to maintain this scheduled ancient monument in good condition.

Our approach to managing our land is exemplified by our management of Clatworthy reservoir.

Right: Example of signage at the reservoir.
Below: Some of the species to be seen around the site.


Wood anenome


Marbled white


Bullfinch


Oil beetle


Small pearl-bordered fritillary


Noctule bat


Redstart


White-tailed bumblebee

Partners Programme

Complementing work on our own land, our Partners Programme has funded projects carried out by wildlife organisations to enhance wildlife or water quality in our region since 1998. During 2010-2015 we funded a wide variety of projects including:

Dorset Wild Rivers (Dorset Wildlife Trust) – more than 14km of chalk stream restoration in Dorset, 30ha of wet woodland planted, 12 new scrapes or ponds, 4,000 volunteer hours pulling Himalayan balsam and 58 farm visits which resulted in 32ha of improved farm habitat

Invertebrates, Springs and Seepages (Buglife) – 33 surveys, improving species records and management guidance for this rare habitat

South Wiltshire Farmland Bird project (Cranborne Chase AONB) – 147 farms received one to one advice and 55 farm stewardship agreements were set up resulting in more than 1,000 hectares of farmland bird habitat

Wessex Chalk Stream project (Wiltshire Wildlife Trust) – 7.5km of river restored at 11 sites on the Upper Hampshire Avon and River Wylye, plus more than 75 advisory visits to landowners.

Our input of £350,000 to six projects secured £1.124m from other sources, extending the impact of our funding and benefits to our region's wildlife.

We have launched a new phase for 2015-20 that will support four large projects:

- the Dorset Wild Rivers project
- Wessex Chalk Streams project
- a refocused South Wiltshire Farmland Conservation project
- a new North Somerset Levels and Moors Grazing Marsh project run by Avon Wildlife Trust.

We will also offer small grants for more local projects, extending the programme's benefits to a wider range of applicants.

Our input of

£350,000

to six projects secured

£1.124m

from other sources...

Carbon and waste management

Our approach to carbon management

One of our long-term sustainability goals is to be carbon neutral in our operations. This requires efforts to avoid greenhouse gas emissions, improve energy efficiency and increase renewable energy generation.

Nearly three quarters of our carbon footprint is due to electricity use, which increased steadily between the early 1990s and 2010 due to tighter sewage treatment standards.

Through our energy management group we are improving energy efficiency and identifying unnecessary power use by auditing sites and interrogating data to pinpoint assets using more power than we would expect.

Our energy use is also closely linked to the weather. Dry conditions such as those experienced in 2011-12 result in less use of energy for pumping, while the very wet weather of 2012-13 and winter 2013-14 saw the opposite, with a lot of additional pumping needed to maintain good sewerage service to our customers.

2014-15

With average rainfall last year, the benefits of our energy efficiency work were evident, rather than cancelled out by adverse weather conditions as in previous two years.

Our energy data hub initiative received an award at the Energy Awards 2014 for its success in gathering data from 2,500 sites and providing clear and accurate energy use information to managers and operators alike.

We completed a facility for exporting biomethane from Bristol sewage treatment works, operated by our subsidiary business GENeco, to the local gas grid. The exported biomethane, produced from the biogas that originates in anaerobic digesters at the site, equates to the gas use of 8,300 homes.

It is also being used to power a bus operated by First West in Bristol that can run for 300km on a single full tank.

We also installed a 50kW solar photovoltaic array at our refurbished Sutton Bingham water treatment works.

The Bio-Bus – running for 300km on a single tank of biomethane

Our approach to waste management

By 2020 we aim to divert 100% of the waste generated from our activities from landfill. And we are currently the only water company that has made this commitment.

As well as the environmental benefits, with landfill tax at £80 a tonne it makes economic sense to aim for these high recycling rates. We fully embrace the waste hierarchy, reducing the generation of waste wherever possible and then reusing and recycling in preference to incineration and landfilling.

We have already achieved more than 97% diversion from landfill (including 100% of our office waste), with the remaining 3% accounted for by items such as contaminated soil and construction wastes that are difficult to reuse or recycle.

Recent work

The new eight million litre underground reservoir at Summerslade Down, which is part of our water supply grid scheme, was constructed using more than 40,000 tonnes of materials recycled on site that would typically be sent to a recycling facility. This reduced vehicle movements and saved the costs and carbon emissions incurred from purchasing and transporting new building materials.

We are also implementing the zero waste aim in our day-to-day operations. One process involves screening plastic, rags, paper and sanitary material, as well as grit from the road that falls into sewers, out of sewage treatment works.

Instead of sending them to landfill we compost these materials at Bristol sewage treatment works. We are in discussion with the Environment Agency to determine the agricultural benefits of the resulting compost like output, which is already gaining interest from farmers because of its nutrient content and soil improving qualities.

We have already achieved more than

97%

diversion from landfill – including

100%

of our office waste...

Grit and screenings before and after the composting process

Looking ahead

As this report has detailed, the next five years will see a great deal of investment to achieve various environmental benefits, through expenditure on physical assets, cooperative work focused on land management, public awareness raising, environmental studies and trialling new technologies. This builds on a more diverse programme developed in the last five years, which was itself based on the solid achievements of the previous 20 years.

Alongside, there are some interesting developments unfolding in how improvements might be delivered for the natural environment, which are likely to feature in future editions of our catchment report.

The concept of 'natural capital' is now gathering momentum, although it was first coined in the early 1970s. It refers to the goods and services provided by nature that are used by society or are needed for ecosystems to function. Examples include:

- photosynthesis by plants and trees, providing food and timber
- water purification through wetlands, soil and rock
- pollination by insects
- the cyclical movement of carbon and nutrients through the atmosphere, land, vegetation and water.

As a concept it is starting to inform policy and business – in 2012 the Natural Capital Committee was set up to advise the government on sustainable use of these and other natural assets, while the Natural Capital Coalition aims to support valuation of natural capital by business, with a protocol being developed for this purpose.

An allied concept is payment for ecosystem services – financial transactions made between those carrying out environmental management or protection and those who benefit from their efforts.

There are increasing examples of this in our sector, with water utilities and businesses which rely on a reliable flow of high quality water paying for land to be managed sympathetically. Our catchment management work, described in various parts of this report, falls into this category.

The next five years will also see the refinement of knowledge and new technologies, much of it coming from the research community and the clean technology sector.

We are actively working with the University of Bath to better understand emerging risks from more novel pollutants such as pharmaceuticals, and on environmental engineering techniques that extract nutrients from effluent in more sustainable ways or capture more energy from sludge.

There are rapid developments in technologies that gather 'big data' from water mains, sewers and treatment processes, which also require developments in how the data is processed, analysed, communicated and acted upon.

At the same time, there is a steady stream of methods for treating water and sewage, adding to the many options already available. And social communications are moving ahead at great speed, with events being reported instantaneously.

Staying on top of these developments is complex but necessary if we are going to thrive in a rapidly changing world and continue to deliver environmental improvements.

We value the good relationships we have with companies and organisations in our sector and others with an interest in the water environment – close cooperation will be needed if we are to achieve the stretching targets that we have for the next five years and beyond.

THE QUEEN'S AWARDS
FOR ENTERPRISE
SUSTAINABLE DEVELOPMENT
2013

CUSTOMER
SERVICE
EXCELLENCE
CSE

4458 Designed by Wessex Water design services
Novembner 2015 Printed on recycled paper

Wessex Water
a YTL company

YTL
SINCE 1955

Registered office: Wessex Water, Claverton Down, Bath BA2 7WW
Telephone: 01225 526 000 Fax: 01225 528 000
Registered in England No 2366648

www.wessexwater.co.uk