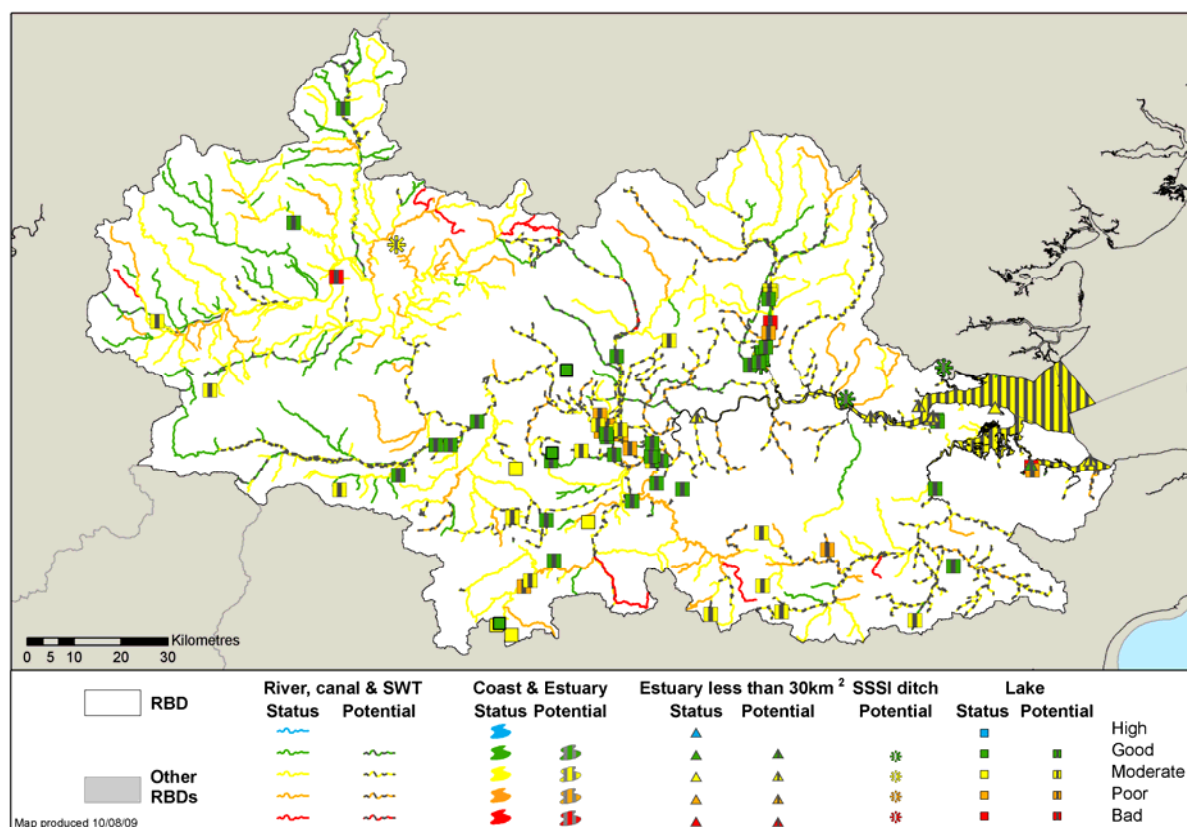


Where possible, investigations will take place before 2013 so that the results are known in time for the formal review of this plan by 2015. The Environment Agency has identified a number of surface water bodies that require investigations in this plan. A proportion of these will lead to actions that should be straightforward to put in place before 2015. The outcome of our detailed planning work is that we have confidence that 25 per cent of surface waters will be in good or better ecological status or potential by 2015. This is our formal target for this plan.

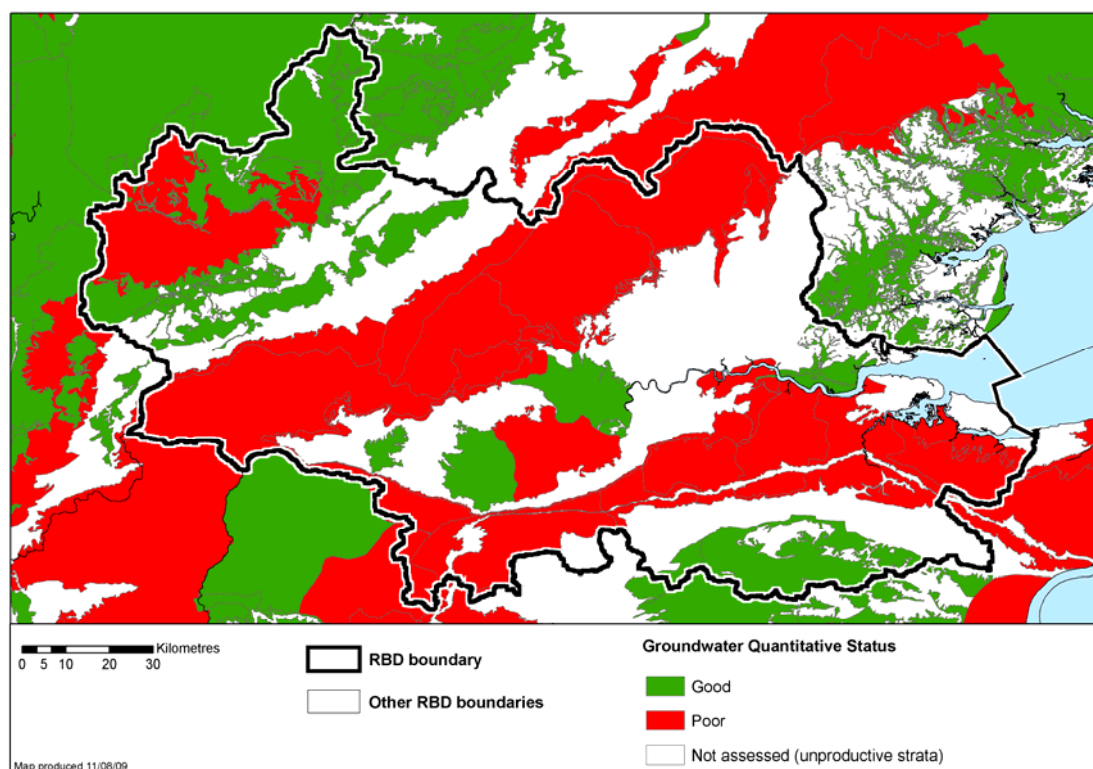
Across England and Wales we have a formal target of achieving 31 per cent of surface waters in good or better ecological status or potential by 2015. Improvement to the water environment has to be managed as a continuum, not in isolated six year cycles. We are already confident in this river basin district that 22 per cent of surface waters will be improved for at least one element by 2015. We are also confident that a proportion of investigations will lead to action that we can put in place before 2015. We will work hard to ensure that the Thames River Basin District makes its contribution to a goal of achieving up to 33 per cent of surface waters across England and Wales at good ecological status or potential by 2015.

Figure 9 Predicted ecological status and potential for surface water bodies in 2015



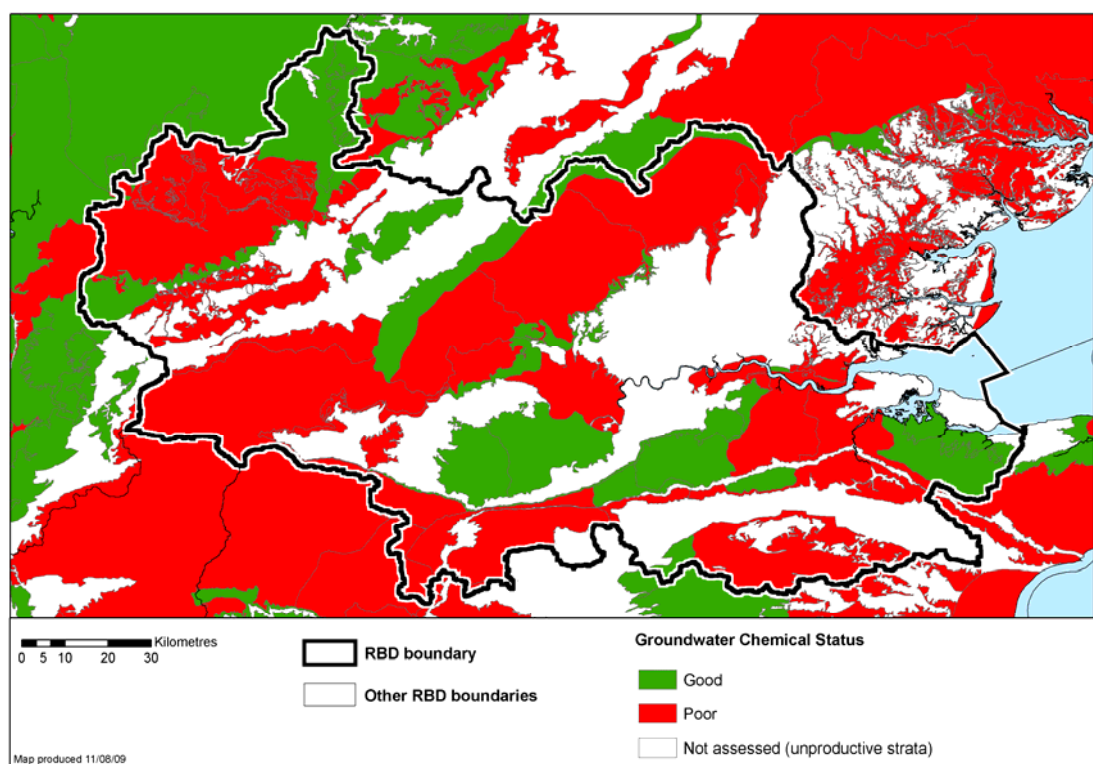
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Figure 10 Predicted quantitative status for groundwater in 2015



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Figure 11 Predicted chemical status for groundwater in 2015



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7 Targets for subsequent cycles

There are three river basin management cycles: 2009-2015, 2015-2021 and 2021-2027. Achieving good status in all water bodies by 2027 is a significant challenge.

The information gained from investigations during the first cycle will help to accelerate improvement to known issues using both traditional and novel techniques in both second and third cycles. New issues will arise though.

This plan sets out where good status cannot be achieved by 2015. This relates to 78 per cent of rivers, 51 per cent of lakes, 100 per cent of estuaries, 100 per cent of coastal waters and 83 per cent of groundwater (based on quantitative status).

In these cases where, an alternative objective of good status or potential by 2021 or 2027 is set (see Annex E).

Over the period to 2027, the pressures on the water environment will change, particularly because of climate change. It is not known in detail how the water environment will respond to this.

The population in the river basin district will continue to increase, with further urbanisation. Agriculture will respond to the changed climate both here and abroad, market conditions, financial incentives and regulatory pressures. Technology and other solutions to address the pressures will improve, but the rate at which some new solutions can be introduced will depend on the economic climate.

The Environment Agency believes that achieving good status in all water bodies by 2027 will not be possible using only current technologies. Even achieving 75 per cent good status will require marked changes in land use and water infrastructure, such as a major programme to separate foul and surface water sewers across most of the river basin district. By current standards, such changes are extremely unlikely to be economically or socially acceptable. For some waters therefore, achieving good status by 2027 could be disproportionately costly or not technically feasible.

The Environment Agency wants to work with others to find and implement additional actions to improve the environment, with the aspiration of achieving good status in at least 60 per cent of waters by 2021 and in as many waters as possible by 2027.

The water environment now and objectives for 2015 are described further in the Section 8 [Thames River Basin District Catchments in 2015](#). A summary of the key statistics for the Thames River Basin District is provided in Section 10.

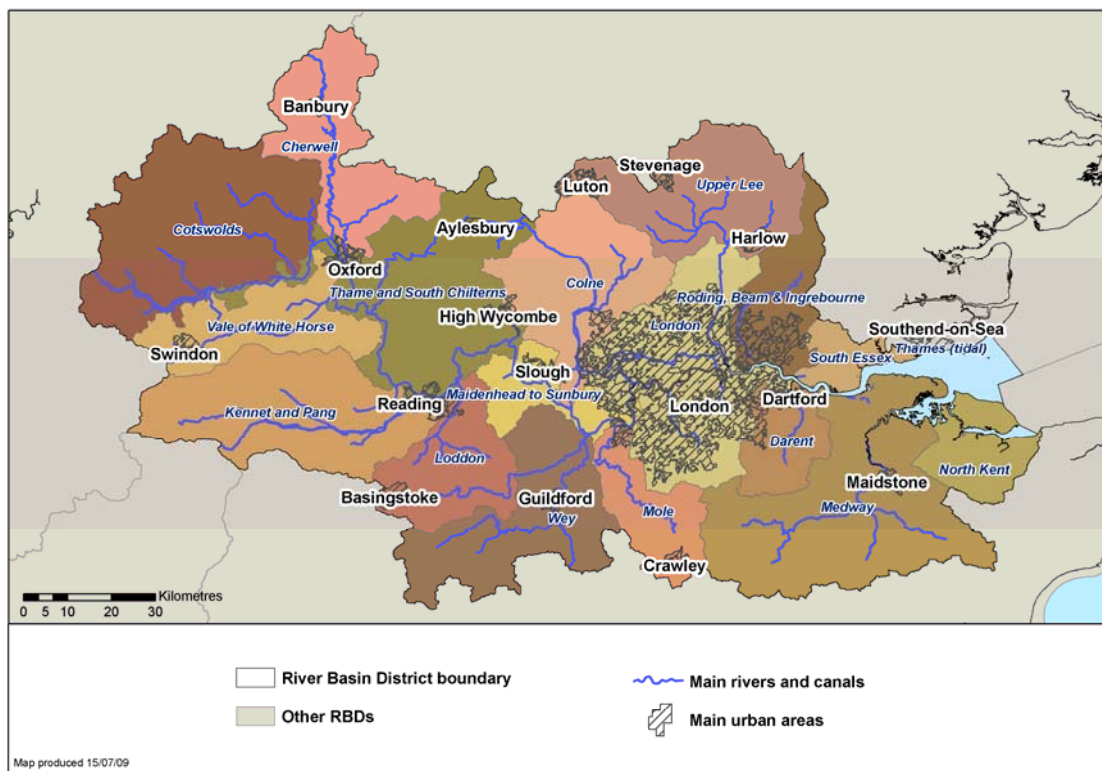
8 Thames River Basin District catchments

This section summarises information about the status of waters in the different parts of the Thames River Basin District, their objectives and some of the actions for them. Rivers and lakes are grouped by catchment. There are 17 river catchments as well as the coastal and estuarine and groundwater catchments presented here. These are shown in figure 12 below.

- [Cherwell catchment](#)
- [Colne catchment](#)
- [Cotswolds catchment](#)
- [Darent and Cray catchments](#)
- [Kennet and Pang catchments](#)
- [Loddon catchment](#)
- [London catchment](#)
- [Medway catchment](#)
- [Mole catchment](#)
- [North Kent](#)
- [Roding, Beam and Ingrebourne catchments](#)
- [South West Essex catchment](#)
- [Thame catchment](#)
- [Thames \(Maidenhead to Sunbury\) catchment](#)
- [Upper Lee catchment](#)
- [Vale of White Horse catchment](#)
- [Wey catchment](#)

There are also separate sections for [estuaries and coastal waters](#), and [groundwater](#).

Figure 12 Thames River Basin District catchments



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Cherwell catchment



Catchment summary

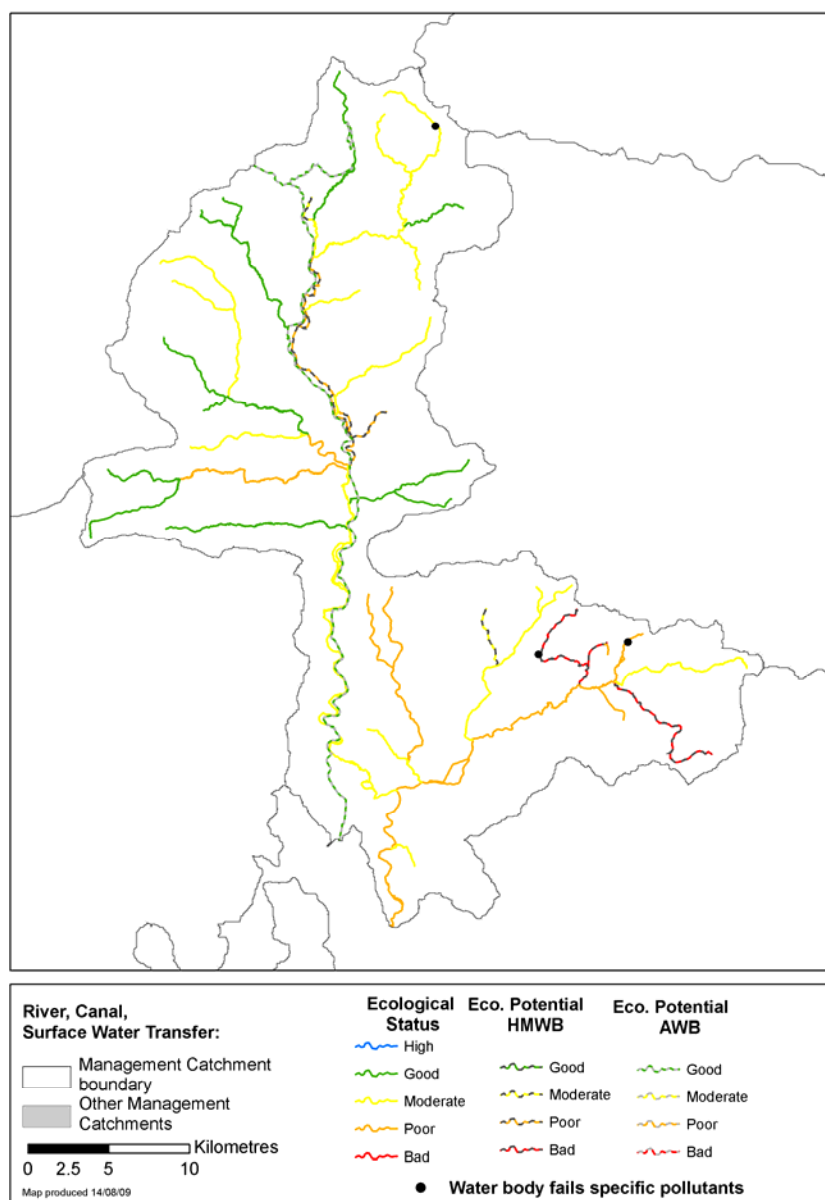
This Cherwell catchment is predominantly rural with some urban areas including the towns of Banbury and Oxford. The river flows south and joins the River Thames at Oxford, but for part of the way it shares a channel with the Oxford Canal.

Surface water quality in most of the catchment is generally good with the River Ray having the poorest water quality. Phosphates, however, show high concentrations across most of the catchment due to diffuse and point source inputs. The catchment also suffers from degraded physical habitat, localised low flows and diffuse pollution.

The impact of water abstraction varies significantly across the catchment, with very little abstraction, for instance, from the Ray catchment. The Upper Cherwell catchment supports abstractions for public water supply at Banbury and from the Sor Brook at Adderbury. There are also a number of licensed abstractions for agriculture. There is concern that the flows in the Cherwell upstream of the Sor Brook confluence are unnaturally low due to abstractions at Banbury and those used to support the Oxford Canal. Some action has been taken with the water company to mitigate these impacts during low flows. Further proposed measures to tackle this include promoting water efficiency measures and liaising with British Waterways.

Physical habitat restoration may also be required to achieve good ecological status on sections of the Cherwell and Ray. Opportunities will be pursued with landowners and other organisations to restore habitat quality. River restoration may also help to restore floodplain habitat, with associated benefits for flood risk management and water quality.

Figure 13 **Map showing the current status/potential of river water bodies in the Cherwell catchment**



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Table 5 **Key statistics for the catchment at a glance**

River and lake water bodies	Now	2015
% at good ecological status or potential	30	32
% assessed at good or high biological status (27 water bodies assessed)	48	48
% assessed at good chemical status (4 water bodies assessed)	75	75
% at good status overall (chemical and ecological)	30	32
% improving for one or more element in rivers		14

There are 36 river water bodies and one lake in the catchment. Four are artificial or heavily modified. 28 per cent of rivers currently achieve good or better ecological status/potential, including Sor brook, High furlong brook and Upper Swere. 48 per cent of rivers assessed for biology are at good or high biological status now, with 30 per cent at poor biological status, and seven per cent of assessed river water bodies at bad biological status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 14 per cent of rivers in the Cherwell catchment will improve for at least one element (biological, chemical or physical) by 2015.

Some key actions for this catchment

- Encourage uptake of Voluntary Initiative best practice advice by farmers and agronomists.
- Target high-risk farms and undertake regulatory farm visits using pollution prevention notices and advisory letters where necessary.
- River Ray Landscape Restoration Project.
- Further investigations to improve understanding of (the scale of) habitat restoration required to achieve Good Ecological Status. Improve understanding of the scale of habitat restoration required to achieve Good Ecological Status / Good Ecological Potential.

Colne catchment



Catchment summary

The Colne catchment is dominated by its chalk streams and rivers. Many of these streams emerge from the areas surrounding the Chilterns Hills, which is designated an Area of Outstanding Natural Beauty (AONB).

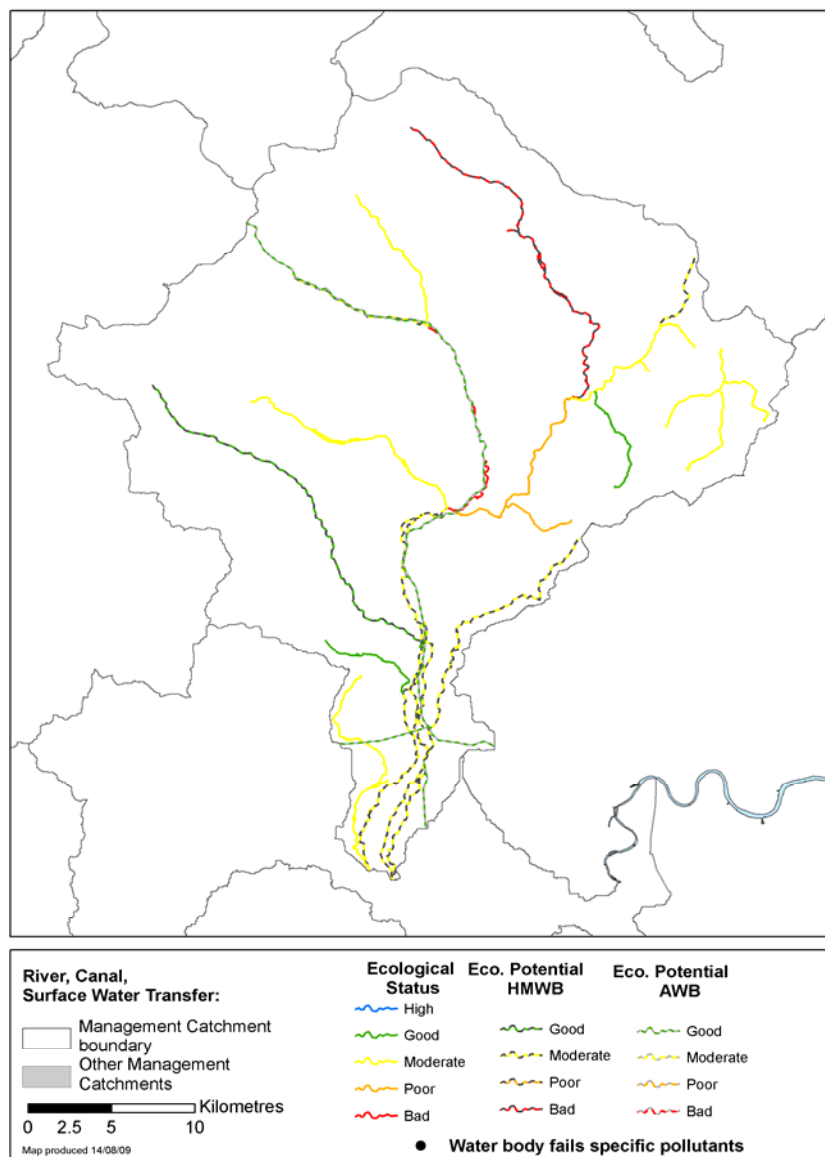
The wetland resource of the Colne Valley is recognised at both European and national level by the South West London Water Bodies Special Protection Area (SPA) and the Mid Colne Valley Site of Special Scientific Interest. These provide important sites for the feeding and roosting of wintering wildfowl.

The Grand Union Canal interacts with the Rivers Bulbourne, Gade and Colne and leads to stretches of these watercourses being considered as heavily modified.

Generally, water quality is moderate but can be influenced by factors such as rural and agricultural run-off, interactions with the canal network and pollution incidents. River modifications including over-widening, channel and bank engineering works and poor maintenance have also affected water quality. These issues have all had an impact on fish species and other wildlife currently found.

Climate change and future demands for water will almost certainly increase the pressure on water resources in these chalk streams and rivers. Low flows continue to be an issue which is exacerbated by abstraction pressures. This has influenced the diversity of the plants and invertebrates found.

Figure 14 **Map showing the current status/potential of river water bodies in the Colne catchment**



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Table 6 **Key statistics for the Colne catchment at a glance**

River and lake water bodies	Now	2015
% at good ecological status or potential	18	23
% assessed at good or high biological status (17 water bodies assessed)	20	30
% assessed at good chemical status (7 water bodies assessed)	71	71
% at good status overall (chemical and ecological)	18	23
% improving for one or more element in rivers		35

There are 17 river water bodies and five lakes in the catchment. Twelve are artificial or heavily modified. 12 per cent of rivers currently achieve good or better ecological status/potential, including the Alderbourne and Tykeswater. 20 per cent of rivers assessed for biology are at good or high biological status now, with 25 per cent at poor biological status, and 15 per cent of assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 35 per cent of rivers in the Colne will improve for at least one element by 2015.

Some key actions for this catchment

- Three Valleys Water will identify further options for improving flows in the River Misbourne.
- The Environment Agency will develop a groundwater model to investigate the relationship between abstraction rates and flow levels in the River Ver.
- The Environment Agency will establish river flow objectives for the Rivers Misbourne and Ver based on ecological species classification.
- The Environment Agency will work with the Farming Wildlife Advisory Group to promote soil and nutrient management plans to local farmers.
- The Environment Agency will work with partners to create reed bed and wetland scrapes on the River Colne at Watford.
- The Environment Agency will carry out pollution prevention work on the Mimmshall Brook.
- The Environment Agency will work with partners to assess improvements for fish passage on the River Colne at Denham Country Park.

Cotswolds catchment



Catchment summary

The Cotswolds are designated as an Area of Outstanding Natural Beauty (AONB), and represent one of the most charismatic landscapes in Britain characterised by rolling limestone hills, dry stone walls and calcareous rivers.

Agricultural land use is predominant but some gravel abstraction is undertaken. The resulting gravel pits have led to the creation of the Cotswolds Water Park which includes a bathing water beach and a Site of Special Scientific Interest (SSSI) lake and is a key area for water sports.

Surface water quality is generally good. Most rivers have shown improvements over the last few years. However, phosphate concentrations are a concern on the Rivers Evenlode, Glyme and Ampney Brook.

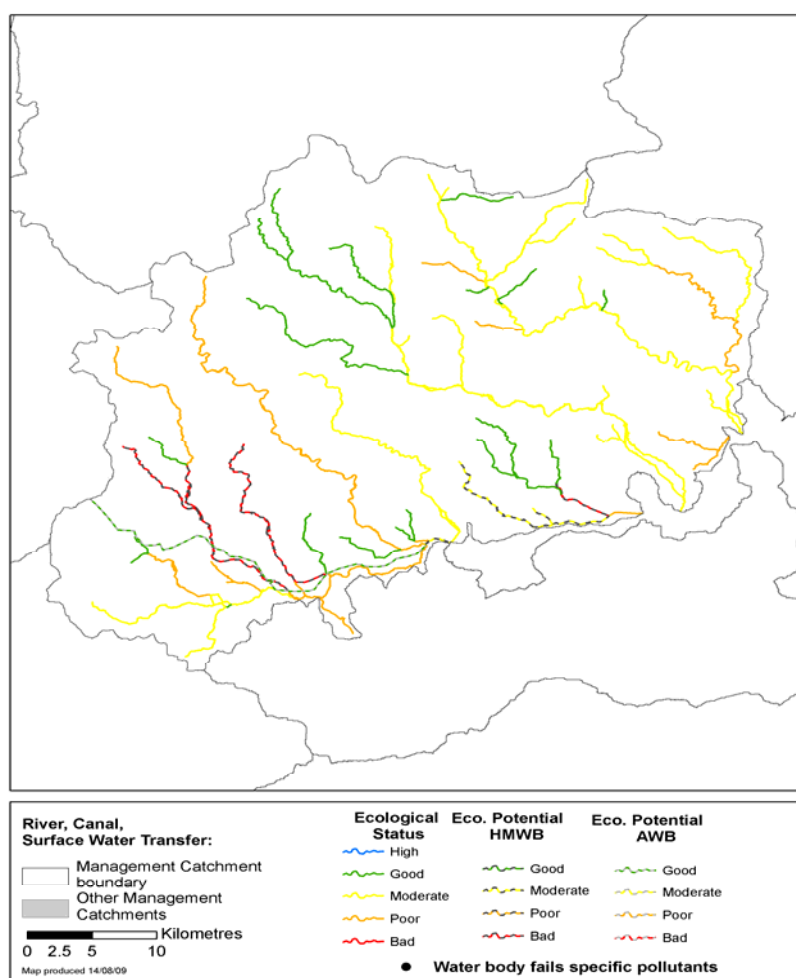
Much of the catchment experiences periodic low flows, which in some locations have been exacerbated by abstraction for public water supply. Previous investigations have resulted in reducing abstraction at a number of locations. Flow and ecological monitoring is being undertaken to assess the benefits of reduced abstraction to rivers such as the Churn and Ampney Brook. Other licences are currently being investigated, such as in the Upper Windrush Valley. Where these are

shown to be damaging to river ecology modifications to existing licences will be secured to address this. Other local measures aimed at reducing demand for water will be centred on working in partnerships to promote and encourage water efficiency through campaigns and advice.

Signal crayfish are now common in many rivers within the catchment. Further investigations are required to understand how their impacts on invertebrate communities may be affecting the likelihood of achieving good ecological status. Measures to control or eradicate them result of from current ongoing research, need to be applied.

Physical habitat restoration may also be required to achieve good ecological status in parts of the Cotswolds where channels have been heavily degraded, such as on certain reaches of the Evenlode. Nevertheless, an improvement of around 60km of river for fish is expected by 2015. Opportunities will be looked into with landowners and other organisations to restore habitat quality.

Figure 15 **Map showing the current status/potential of river water bodies in this catchment**



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Table 7 Key statistics for the Cotswolds catchment at a glance

River and lake water bodies	Now	2015
% at good ecological status or potential	38	47
% assessed at good or high biological status (39 water bodies assessed)	28	43
% assessed at good chemical status (4 water bodies assessed)	100	100
% at good status overall (chemical and ecological)	38	47
% improving for one or more element in rivers		31

There are 51 river water bodies and two lakes in the catchment. Four are artificial or heavily modified. 37 per cent of rivers currently achieve good or better ecological status/potential, including the Shill brook and Kencot brook and Serbourne brook. 28 per cent of rivers assessed for biology are at good or high biological status now, with 30 per cent at poor biological status, and 10 per cent of assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 31 per cent of rivers in the Cotswolds will improve for at least one element by 2015.

Some key actions for this catchment

- Contribute to achieving favourable condition on Cotswold Water Park Sites of Special Scientific Interest by implementing invasive species control programme.
- Investigate impact of sediments on ecological status.
- Contribute to achieving favourable condition on Cotswold Water Park Site of Special Scientific Interest by planning permission - enforcement/revocation.
- Apply national guidance framework on disposal of dredging to refine local measures as appropriate (where not disproportionately costly or technically infeasible).

Darent and Cray catchment



Catchment Summary

The River Cray is the largest tributary of the Darent, which joins the River Darent at Crayford. As with the River Darent the tidal limit is just upstream of the confluence and is controlled by a weir at Barnes Cray. The River Shuttle is the Cray's largest tributary, draining approximately 30 per cent of the sub-catchment. The Cray and Shuttle are very urbanised so the Darent has associated ecological pressures from river modification and contamination issues.

The River Darent is unusual for a moderate sized river as there are virtually no discharges into the river and consequently the water quality is generally good. The river is fed from the chalk aquifers as well as some spring flow from the large Lower Greensand Beds to the south of the upper catchment.

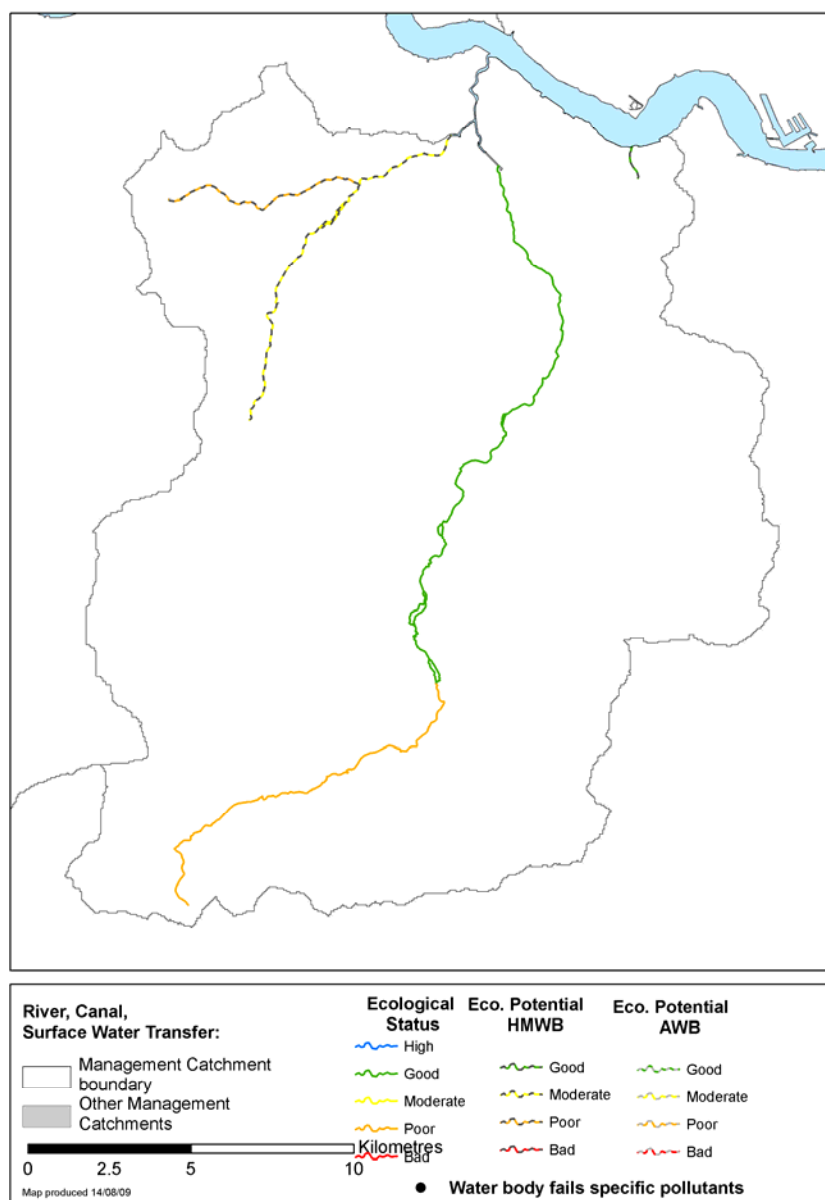
The impact of low flows upon the River Darent has significantly affected the invertebrate fauna. Several species came close to extinction from this catchment and the observed re-colonisation rates of several species have been extremely slow. Although the middle section of the river was observed to experience the greatest impact from low flows, it is known that Otford (a site situated further up the catchment) is also adversely affected by low flows.

The Darent Action Plan has seen reductions in abstraction from the underlying chalk aquifer. This benefits many species in particular fish populations such as brown trout, invertebrates such as river limpet, as well as aquatic plant species. The ecology in the mid Darent still suffers in dry years. The final stage of the Darent Action Plan is required to sustain minimum flows in these periods. This will also reduce dependency on the flow augmentation provided by adjacent chalk boreholes.

There is still concern about the impact of low flows on ecology. In dry years, the flows still need to be supported by augmentation boreholes. In addition, the channel shape is still a limiting factor. Water quality in the more urbanised area of the Cray and in particular, the Shuttle, is particularly influenced by urban runoff.

The groundwater quality within this catchment is at risk from inputs from nitrates, pesticides, solvents and hydrocarbons. The impacts relate to the land-uses so the agricultural areas show high levels of nitrates and the industrial areas in the low-lying valleys are also impacted by solvents and hydrocarbons. The groundwater quality is likely to interact with the surface water in some areas, impacting on the ecology of the surface water bodies.

Figure 16 Map showing the current status/potential of rivers in the Darent and Cray catchment



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Table 8 Key statistics for the Darent & Cray catchment at a glance

River and lake water bodies	Now	2015
% at good ecological status or potential	33	33
% assessed at good or high biological status (5 water bodies assessed)	40	40
% assessed at good chemical status (2 water bodies assessed)	50	50
% at good status overall (chemical and ecological)	33	33
% improving for one or more element in rivers		33

There are six river water bodies and no lakes in the catchment. Two are artificial or heavily modified. 33 per cent of rivers currently achieve good or better ecological status/potential, including the Mid Darent and Upper Cray. 40 per cent of rivers assessed for biology are at good or high biological status now, with 40 per cent at poor biological status, and no assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 33 per cent of rivers in the Darent and Cray catchment will improve for at least one element by 2015.

Some key actions for this catchment

- The Environment Agency will investigate the reasons for low ecological quality.
- Thames Water and the Environment Agency will investigate sewage misconnections the Darent and Cray.
- Thames Water and the Environment Agency will seek to fulfil the Darent Action Plan to secure sustainable abstraction in the Darent between Otford and Hawley.
- Thames Water will assess options for improving groundwater abstraction in the Upper Cray once approved in the Periodic Review.
- The Environment Agency will investigate sources of hydrocarbons and solvents in Crayford and Dartford and undertake pollution prevention visits at priority sites such as Westerham.
- The Environment Agency will work with landowners to address barriers to fish passage at sites including Vitbe Mill and Wellcomme's structure at Dartford.
- The Environment Agency will carry out investigative monitoring and field work into the origins of, causes of and solutions to pollution.
- The Environment Agency will establish a 'Regional Better Rivers Programme' to improve habitat and ecology in a first round of waters.
- The Environment Agency will carry out investigative monitoring and field work into the origins, causes and solutions to sedimentation.
- The angling club which controls the fishing at Preston Farm will have an enhancement plan that endeavours to improve the fish habitat. It will provide challenging and varied fly fishing, by installing flow deflectors, where it is deemed necessary.
- Pollution prevention campaigns around groundwater abstractions to decrease the inputs of nitrates, pesticides, hydrocarbons and solvents.

Kennet and Pang catchment



Catchment summary

The Rivers Kennet, Pang and Lambourn are chalk streams which flow through the Marlborough downs. They are home to wild brown trout and are characterised by chalkstream aquatic plant species such as *rununculus*. Although the upper stretches of the Kennet are mainly rural the river passes through Marlborough, Hungerford, Newbury and Reading before reaching the River Thames.

Surface water quality in the catchment is generally good, although Tributyltin compounds are causing a current failure in the Foudry Brook.

The Kennet has experienced considerable turbidity issues which can effect the gravels and the aquatic vegetation making it less suitable for fish communities and aquatic insects. Part of the source of this sedimentation is the numerous small streams which enter the River Kennet and Kennet and Avon canal as well as land practices. Runoff from land is connected to the river by tracks, roads, and the footpath network through road side drains and gulleys.

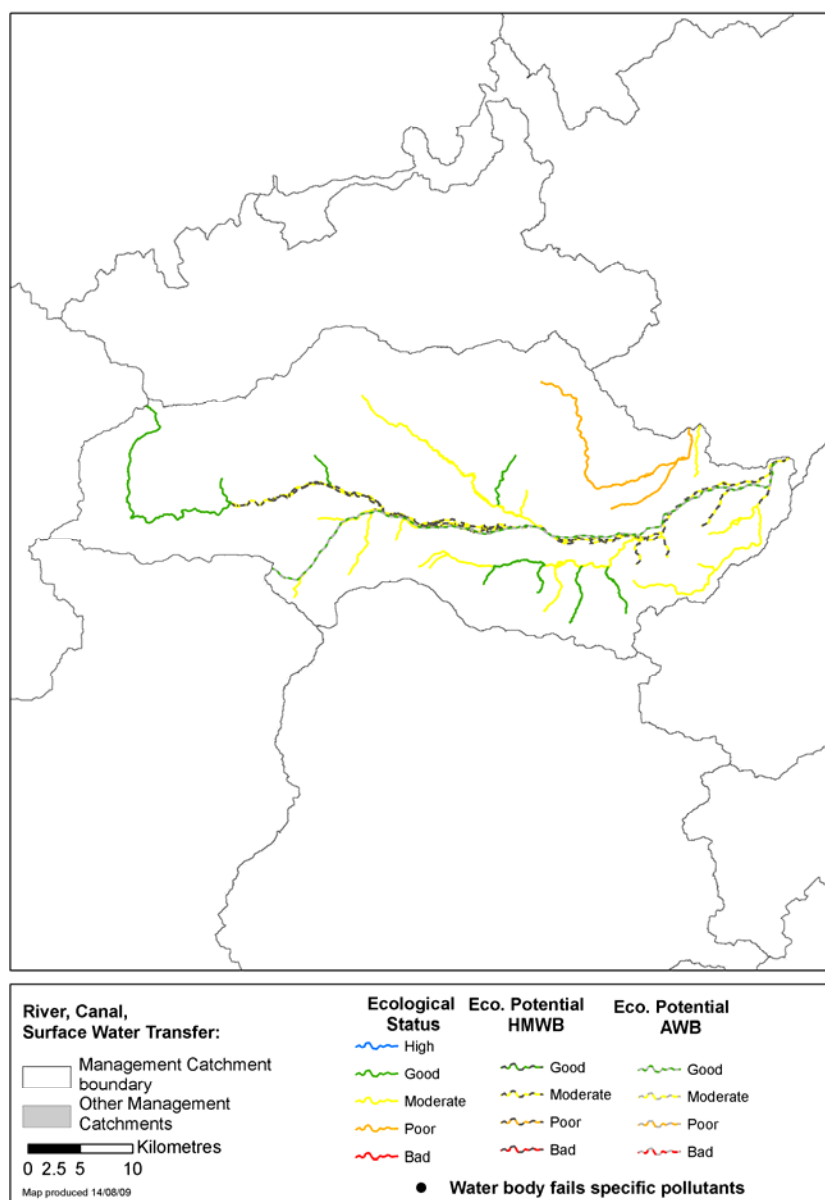
The catchment has several abstractions predominantly from groundwater sources, for supplying water to urban areas outside of the catchment. A number of abstraction licences have been investigated to assess their impacts on ecology. Actions have been put in place or are planned to reduce these impacts where they have been established as unacceptable (for example. at Axford on the Kennet). Further investigations are underway on other licences such as at Ogbourne and Pangbourne. Other local measures aimed at reducing demand for water will be centred on working in partnership to promote and encourage water efficiency through campaigns and advice.

Measures to mitigate against diffuse pollution include promotion of Codes of Good Agricultural Practice (CoGAP) and the use of soil and nutrient management plans. Some of this will be delivered through the English Catchment Sensitive Farming Delivery Initiative and associated projects. Work will continue to investigate the adverse impacts on river quality due to the interaction between the River Kennet and the Kennet and Avon Canal.

Point source pollution will be dealt with through investigation into the impacts of emissions from Kintbury and Chilton Foliat Sewage Treatment Works, and the collection of water quality and ecological data from up and downstream of a number of smaller sewage treatment works. There is also a need to. This will provide information for future actions (for instance for future asset management programme (AMP) schemes).

Physical habitat restoration is needed at a number of locations to address the problems of past engineering and the impacts of control structures where these are severely limiting the ecological potential of the catchment. Some of this work will be done under a programme to restore the River Kennet and River Lambourn Sites of Special Scientific Interest, but additional works are required for degraded reaches elsewhere.

Figure 17 **Map showing the current status/potential of rivers in the Kennet and Pang catchment**



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Table 9 **Key statistics for the Kennet & Pang catchment at a glance**

River and lake water bodies	Now	2015
% at good ecological status or potential	34	40
% assessed at good or high biological status (26 water bodies assessed)	43	50
% assessed at good chemical status (8 water bodies assessed)	88	100
% at good status overall (chemical and ecological)	34	40
% improving for one or more element in rivers		29

There are 31 river water bodies and four lakes in the catchment. Eight are artificial or heavily modified. 29 per cent of rivers currently achieve good or better ecological status/potential, including the Baughurst brook and Foudry brook. 38 per cent of rivers assessed for biology are at good or high biological status now, with only four per cent at poor biological status, and no assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 29 per cent of rivers in the Kennet and Pang will improve for at least one element by 2015.

Some key actions for this catchment

- Contribute to achieving favourable condition on River Kennet Site of Special Scientific Interest (SSSI) by revoking or amending abstraction licences.
- Contribute to achieving favourable condition on River Kennet SSSI by implementing appropriate dredging programme.
- Contribute to achieving favourable condition on River Kennet SSSI by regulation of boat movements.
- The Environment Agency will investigate the impact of sediments on ecological status.
- The Environment Agency will work with local authority and local stakeholders to develop methods to tackle diffuse rural and urban pollution and river restoration through the Kennet Chalkstream Restoration Project.
- Implementation of mitigation scheme to reduce risk to site from Berkshire Groundwater Scheme: Kennet & Lambourn Floodplain candidate Special Area of Conservation.
- The Environment Agency will work towards removing obsolete structures.
- Collect water quality and ecological monitoring samples from up and downstream of a number of smaller sewage treatment works to provide information for potential future actions (for instance future asset management programme (AMP) schemes).

Loddon catchment



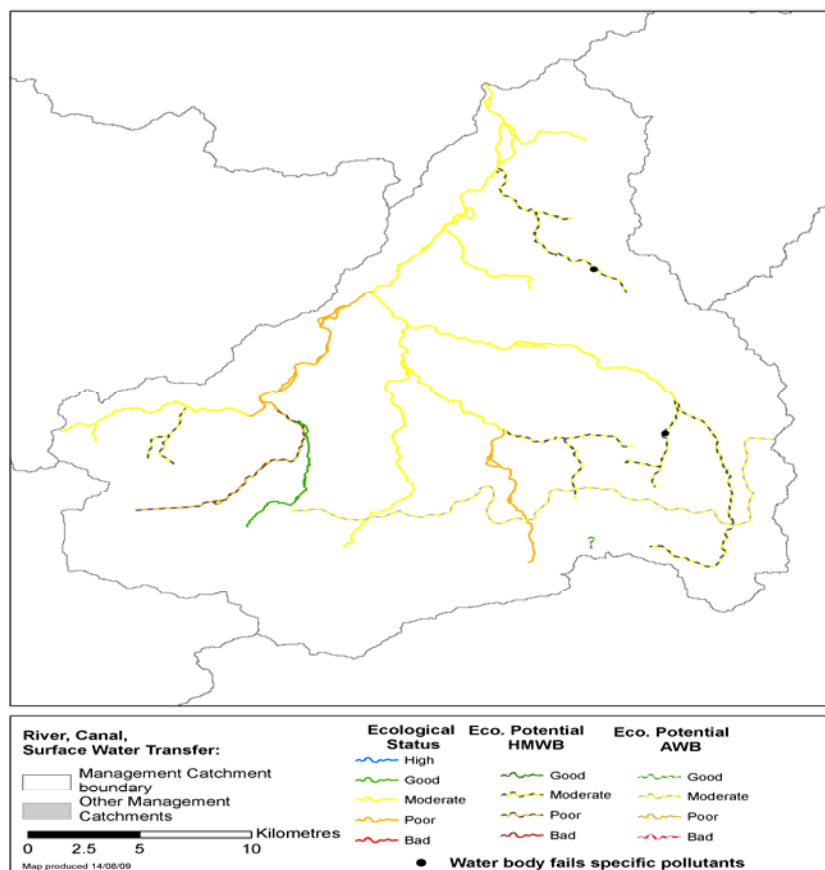
Catchment summary

This catchment is predominantly rural with some urban areas including the towns of Basingstoke, Aldershot and Wokingham. The main River Loddon is fed by a number of tributaries including the Rivers Whitewater, Hart and Blackwater as well as the Emm Brook. The Basingstoke Canal cuts across the southern part of the catchment. This catchment also includes Fleet Pond, Heath Lake and Mytchett Lake Sites of Special Scientific Interest (SSSI).

Phosphate levels are high in a number of rivers for example the River Blackwater. High levels of nutrients in rivers can lead to excessive plant growth and in turn affect the river's wildlife. Sources of nutrients in this catchment include effluent from sewage treatment works and agricultural pollution. Substantial urban development, which will increase the volume of treated effluent as well as demand for water supply, is also planned for this catchment.

Some rivers in this catchment are designated heavily modified. Modification of these rivers including in-stream structures has led to loss of habitat diversity and the creation of barriers for fish migration. These issues and the presence of pollutants give rise to poor water quality for a number of rivers, as well as varied biological quality throughout the catchment.

Figure 18 Map showing the current status/potential of rivers in the Loddon catchment



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Table 10 Key statistics for the Loddon catchment at a glance

River and lake water bodies	Now	2015
% at good ecological status or potential	9	9
% assessed at good or high biological status (17 water bodies assessed)	41	47
% assessed at good chemical status (6 water bodies assessed)	83	83
% at good status overall (chemical and ecological)	9	9
% improving for one or more element in rivers		32

There are 19 river water bodies and three lakes in the catchment. Nine are artificial or heavily modified. Five per cent of rivers currently achieve good or better ecological status/potential, including the Lyde. 41 per cent of rivers assessed for biology are at good or high biological status now, with 41 per cent at poor biological status, and no assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 32 per cent of rivers in the Loddon will improve for at least one element by 2015.

Some key actions for this catchment

- In support of the Loddon Farm Advice Project, the Hants and Isle of Wight Wildlife Trust will promote the use of soil and nutrient management plans and raise awareness of Codes of Good Agricultural Practice and Best Farming Practice.
- The Environment Agency will undertake farm visits and work with farmers to provide pollution prevention advice and information to ensure farming activities are not causing a detrimental impact on the environment.
- The Environment Agency will investigate the potential for improvements to sewage treatment works that could be included in the programme of work under the 2014 periodic review..
- The Environment Agency, in partnership with Thames Water and local landowners, will carry out modifications and improvements at Arborfield that will improve the habitat of the river in this area and allow fish to migrate upstream. This will improve the status of fish populations in the River Loddon (Swallowfield to River Thames confluence), and in other water bodies upstream.
- Throughout the catchment, there is a requirement for further monitoring and investigation is required to allow targeting of additional actions to improve the status of this catchment.

London catchment



Catchment summary

The London catchment is comprised of the non tidal urban tributaries of the Thames Tideway. This includes the lower River Lee and its main tributaries, Pymmes, Salmon and Cobbins Brooks, and the Rivers Brent and Crane to the north of London. To the south of London, rivers include the Hogsmill, Beverly Brook, Wandle and Ravensbourne. The Tidal River Thames and its creeks are discussed in the Estuaries and Coastal Waters Catchment.

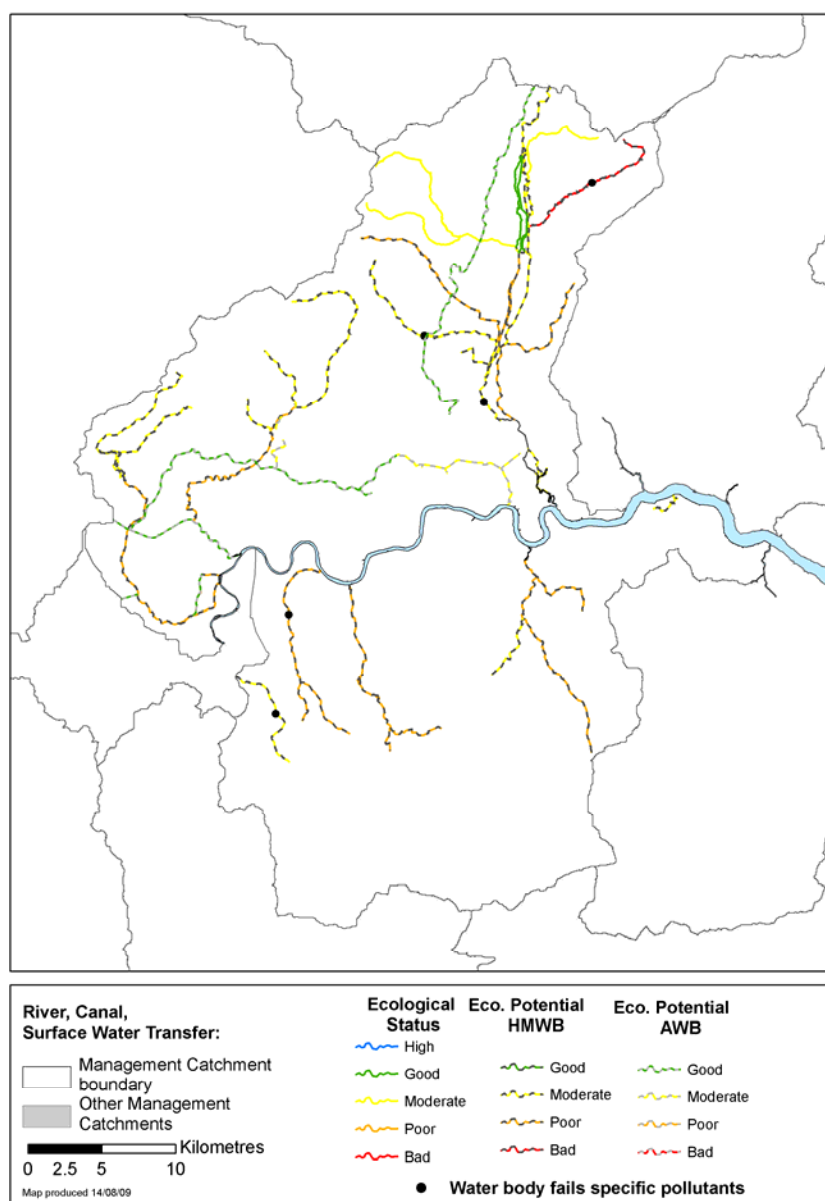
This catchment is highly urbanised with Greater London situated at its heart. The majority of rivers are designated heavily modified and there is a distinct lack of natural river processes throughout the catchment. The modification of rivers including in-stream structures has led to loss of habitat diversity and the creation of barriers for fish migration. Examples include in-stream structures in the Lee Navigation and Lee Flood Relief Channel and extensive concrete lined and culverted reaches of the River Wandle.

Water quality remains a significant issue in this catchment. The highly urbanised nature exacerbates the pollution pressures particularly through increased surface water run-off, storm sewage overflows and misconnections, alongside effluent from sewage treatment works. These issues, the presence of invasive species and physical modification pressures, give rise to poor water quality and habitat diversity for a number rivers, as well as varied biological quality throughout the catchment.

The wetland resource of the Lee Valley is recognised at both European and National level by the Lee Valley Special Protection Area (SPA) and there are a number of Sites of Special Scientific Interest (SSSI) in the catchment.

The construction works for the 2012 Olympics and associated legacy developments will provide the single biggest opportunity to improve the lower reaches of the River Lee and its backwaters.

Figure 19 Map showing the current status/potential of rivers in the London catchment



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Table 11 Key statistics for the London catchment at a glance

River and lake water bodies	Now	2015
% at good ecological status or potential	18	20
% assessed at good or high biological status (21 water bodies assessed)	23	23
% assessed at good chemical status (9 water bodies assessed)	44	67
% at good status overall (chemical and ecological)	18	20
% improving for one or more element in rivers		32

There are 28 river water bodies and 17 lakes in the catchment. 41 are artificial or heavily modified. 4 per cent of rivers currently achieve good or better ecological status/potential, including the small River Lee (and tributaries). 10 per cent of rivers assessed for biology are at good or high biological status now, with 57 per cent at poor biological status, and 13 per cent of assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 32 per cent of rivers in London will improve for at least one element by 2015.

Some key actions for this catchment

- The Environment Agency will undertake pollution prevention projects on Pymmes Brook, Brimsdown Ditch and the River Wandle.
- The Environment Agency will investigate the causes of urban diffuse pollution on the Ravensbourne.
- Thames Water will construct the Lee Tunnel. This will reduce the number of storm discharges into the River Lee.
- Thames Water have planned improvements at their Deephams waste water treatment works.
- The Environment Agency will work with partners at Cranebank to put the river back on its original meandering course and improve fish populations..
- The Environment Agency and Natural England will work together to continue to develop and implement the London Rivers Action Plan to improve ecology through habitat creation and enhancement.
- Physical habitat pressures will be considered through the delivery of proposed flood risk management work, for example at Ashlone Wharf and Worcester Park on the Beverley Brook.

Case study 4: **Dredging of the River Lee Navigation, to improve water quality**

Historic poor urban water quality and low levels of dissolved oxygen has been shown to be due in part to the accumulation of contaminated sediment in the canalised River Lee Navigation.



The Environment Agency funded a dredging programme which was completed in early 2009. The task to remove urban sediment and other matter from the canal over a distance of 3.2kms was completed over a 3 month period at a cost of £2million. As a result of the initiative over 30,000 m³ of sediment was removed in addition to 3 tonnes of tyres, 3 cars, 40 motorbikes and 120 shopping trolleys.

The sediment was initially identified as hazardous and non-hazardous waste following extensive sampling. The hazardous material was transferred to a waste bioremediation centre in West London for subsequent use as landfill engineering cover.

As part of the overall aims of the programme, sediment was used to create bankside enhancement by depositing material behind wooden piling in combination with geotextile membrane to form soft vegetated margins. Over time the improved bankside habitat will help to improve biodiversity and aesthetics along the canal.

Thames (Maidenhead to Sunbury) catchment



Catchment summary

The non-tidal Lower River Thames is a prime recreation and leisure resource used for canoeing, rowing, fishing, walking and cruising. The Thames Path National Trail runs its entire length and also forms part of a national cycleway.

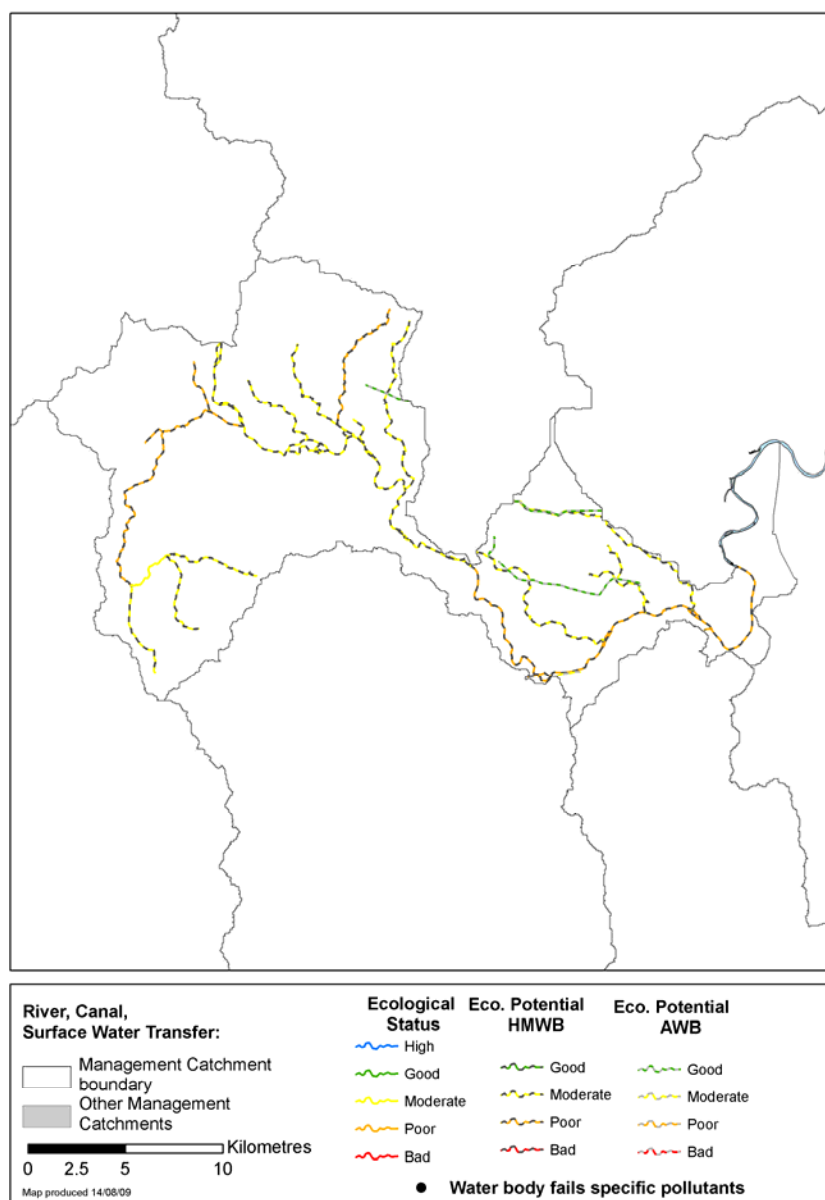
The catchment includes the Lower River Thames and a number of its tributaries including the Cut, Maidenhead, Boveney and Chalvey Ditches, the Salthill Stream and Datchet Common Brook. It includes Bessborough, Knight and Queen Elizabeth II Storage Reservoirs as well as Englemere Pond and Littleworth Ponds Sites of Special Scientific Interest. The majority of these rivers are designated heavily modified for navigation, flood risk management and abstraction purposes. The catchment is further characterised by urban development and includes the towns of Bracknell, Maidenhead, Windsor, Slough and Staines.

Phosphate levels are high in a number of rivers. High levels of nutrients in rivers can lead to excessive plant growth and in turn affect the river's wildlife. Sources of nutrients in this catchment include effluent from sewage treatment works.

Modification of these water bodies including in-stream structures has led to loss of habitat diversity and the creation of barriers for fish migration. Considerable water abstraction requires the flow on the main River Thames to be closely managed through the Lower Thames Operating Agreement with Thames Water.

The above issues and the presence of pollutants give rise to poor water quality and habitat diversity on a number of rivers, as well as varied biological quality throughout the catchment.

Figure 20 **Map showing the current status/potential of rivers in the Maidenhead to Sunbury catchment**



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Table 12 **Key statistics for the Maidenhead to Sunbury catchment at a glance**

River and lake water bodies	Now	2015
% at good ecological status or potential	23	23
% assessed at good or high biological status (11 water bodies assessed)	35	35
% assessed at good chemical status (6 water bodies assessed)	83	100
% at good status overall (chemical and ecological)	23	23
% improving for one or more element in rivers		7

There are 14 river water bodies and 12 lakes in the catchment. 23 are artificial or heavily modified. None of the catchment currently achieves good or better ecological status/potential. 45 per cent of rivers assessed for biology are at good or high biological status now, with 41 per cent at poor biological status, and no assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. Seven per cent of rivers in the Thames (Maidenhead to Sunbury) will improve for at least one element by 2015.

Some key actions for this catchment

- The Environment Agency will investigate improvements to sewage treatment works that could be included in the programme of work under the 2014 periodic review.
- The Environment Agency will install an elver (juvenile eel) ladder at Teddington weir, which will allow more elvers to migrate upstream into the freshwater River Thames (Egham to Teddington) and improve populations of this important, threatened, and declining species.
- The Environment Agency and Thames Water will undertake an investigation to assess the impact of abstraction on the ecology, recreation and navigation of the Lower Thames..
- Throughout the catchment, there is a requirement for further monitoring and investigation to allow targeting of additional measures to improve the status of this catchment.

Medway catchment



Catchment summary

The Medway catchment contains three main rivers; the Medway itself which has its source in the Hastings Beds in the south of the catchment, the river Eden, a more flashy catchment flowing from the west and and the river Beult; a Weald Clay dominated river which flows from the East. The three rivers join at Yalding and flow through Maidstone to the Thames Estuary at Rochester and Chatham. Most of the catchment area is lies between 150 and 200m above sea level.

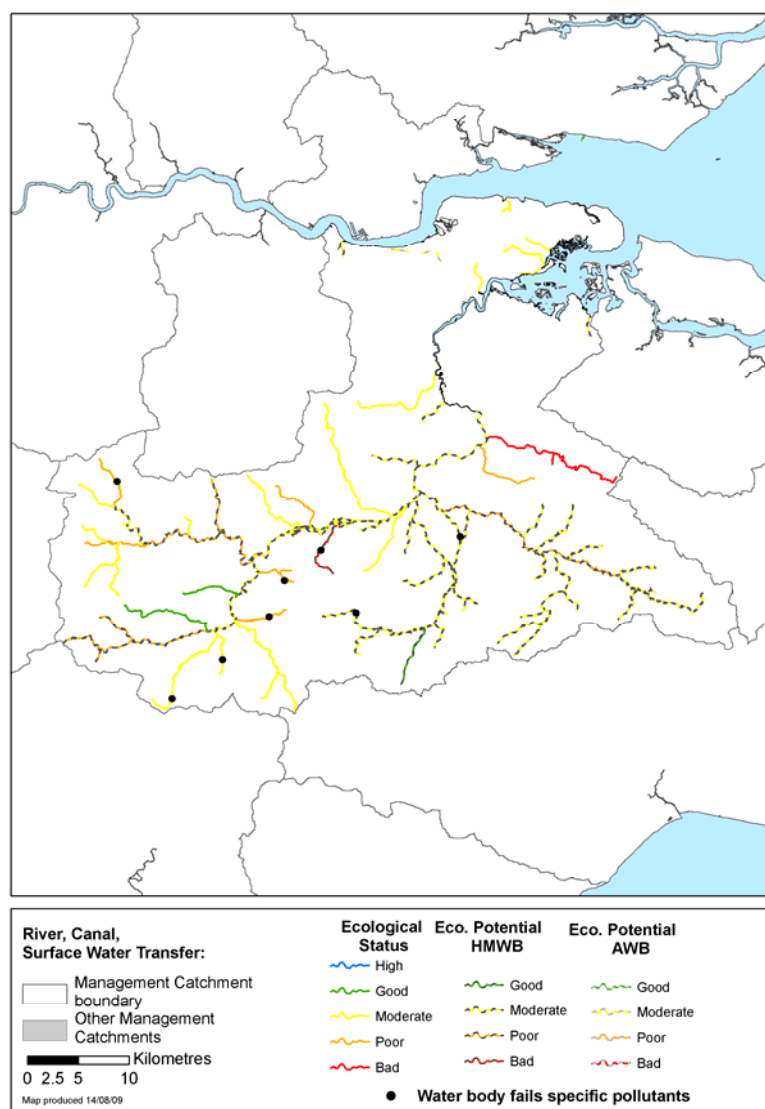
Whilst downstream of Maidstone the river flows through urban settlements and receives discharges from industry, upstream of Maidstone the area is predominately agricultural. Agriculture in the upper reaches of these areas tends to be mixed, whilst arable farming dominants areas of flatter land, particularly on the floodplains east of Tonbridge and on the lower reaches of the Beult. There remains a concentration of orchards and hops in the lowlands between Maidstone, Sevenoaks and Royal Tunbridge Wells.

The Medway is heavily engineered to manage flood risk and for navigation requirements. The Medway towns have a long history of river based industry and a series of locks exist between Maidstone and Leigh (near Tonbridge) to ensure that a large proportion of the river is navigable. Many of these locks form barriers to fish migration and as such one of the challenges for the Medway is to ensure that fish passes are fitted to these structures. The fish pass structures also

incorporate canoe passes so that both ecological and recreational benefits are gained. This is particularly relevant in the Medway which enjoys high levels of recreational and angling interest.

Nearly three quarters of the Medway catchment is protected by landscape designations. The Kent Downs Area of Outstanding Natural Beauty (AONB) covers the Chalk downland of the North Downs and significant stretches of the Medway valley. This area is noted for its Chalk scarp, Chalk downland pastures and ancient woodland. The High Weald AONB covers the high well-wooded ground of the Hastings Beds sandstones and clays in the south of the catchment. In addition there are large areas of freshwater grazing marsh along the North Kent coast and on fragments of the habitat inland, particularly above Maidstone. This area supports internationally important populations of wildfowl and migratory birds.

Figure 21 Map showing the current status/potential of rivers in the Medway catchment



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Table 13 Key statistics for the Medway catchment at a glance

River and lake water bodies	Now	2015
% at good ecological status or potential	10	10
% assessed at good or high biological status (40 water bodies assessed)	35	42
% assessed at good chemical status (12 water bodies assessed)	92	92
% at good status overall (chemical and ecological)	10	10
% improving for one or more element in rivers		28

There are 60 river water bodies and 9 lakes in the catchment. 41 are artificial or heavily modified. Five per cent of rivers currently achieve good or better ecological status/potential. 38 per cent of rivers assessed for biology are at good or high biological status now, with 26 per cent at poor biological status, and five per cent of assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 28 per cent of rivers in the Medway will improve for at least one element by 2015.

Some key actions for this catchment

- Southern Water will improve sewage works at five locations to reduce inputs of nutrients including phosphate and improve shellfish waters.
- The Environment Agency will promote good practice to avoid pollution from construction sites in the Loose and Somerhill stream.
- South East Water will investigate abstraction from the Greensand Sources in the Leybourne and Bourne in the Periodic Review process.
- The Environment Agency will educate and raise awareness of the impact that small discharges to ground and surface water have on water quality of the receiving waters, This is with a view to advising residents of the need to connect to the mains sewer system across many of the rivers including the Barden Mill Stream, Teise, Eden, and Medway between the Eden, Crowborough and Yalding.
- The Environment Agency will identify and improve private discharges in rivers such as Eden at Bough Beech, Len and the Loose.
- The Environment Agency will carry out additional investigative monitoring and field work into the origins of, causes of and solutions to sedimentation in rivers including Somerhill Stream, Hammer Stream and the Medway at Weir Wood.
- The Environment Agency will carry out investigative monitoring and field work into the origins of, causes of and solutions to pollution where we need to improve certainty in many water bodies such as the river Bourne, Eridge Stream, Pippingford Brook and the Beult.
- The Environment Agency will establish a 'Regional Better Rivers Programme' to improve habitat and ecology in a first round of waters in rivers such as the Beult, Len and Loose Stream.
- The Environment Agency will work with landowners to address barriers to fish passage at sites including Allington and East Farleigh.
- The Environment Agency will re-survey of the upper reaches of the river Grom to establish current ecological quality, after improvements to the existing combine sewer outfall system.
- Pollution prevention campaigns around groundwater abstractions to decrease the inputs of nitrates, pesticides, hydrocarbons and solvents.

Mole catchment



Catchment summary

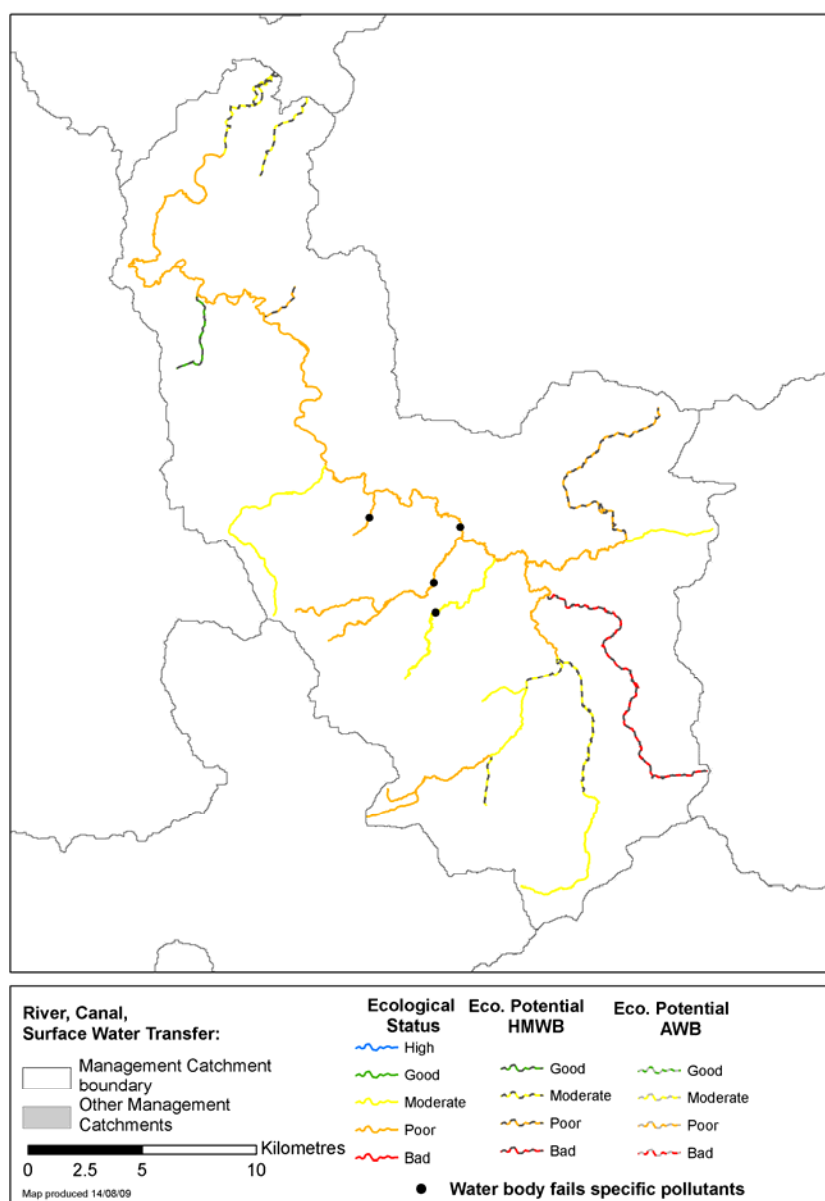
This catchment is characterised by urban development and agricultural land use. It includes the towns of Crawley, Leatherhead and Reigate and a large number of rural villages, particularly in the upper catchment; as well as Gatwick Airport. The main River Mole is fed by a number of tributaries including the Gatwick Stream, Redhill Brook and the Salfords Stream. This catchment also includes Island Barn Reservoir, and Black Pond and Douster Pond Sites of Special Scientific Interest (SSSI).

Phosphate and Ammonia levels are high in a number of rivers. High levels of nutrients in rivers can lead to excessive plant growth that in turn affect the river's wildlife. Sources of nutrients in this

catchment include effluent from sewage treatment works. In addition, the clay characteristics of the upper catchment exacerbate surface water run-off and some canalised and shaded reaches suffer low dissolved oxygen in times of low flow. Sudden decreases in dissolved oxygen has a detrimental affect on fish and may damage other wildlife. Substantial urban development, which will increase the volume of treated effluencnt as well as demand for water supply, is also planned for this catchment.

Some rivers in this catchment are designated heavily modified. Modification of these rivers including in-stream structures has led to loss of habitat diversity and the creation of barriers for fish migration. These issues and the presence of pollutants give rise to poor water quality for a number rivers, as well as varied biological quality throughout the catchment.

Figure 22 **Map showing the current status/potential of rivers in the Mole catchment**



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Table 14 **Key statistics for the Medway catchment at a glance**

River and lake water bodies	Now	2015
% at good ecological status or potential	13	13
% assessed at good or high biological status (18 water bodies assessed)	11	17
% assessed at good chemical status (3 water bodies assessed)	100	100
% at good status overall (chemical and ecological)	13	13
% improving for one or more element in rivers		25

There are 20 river water bodies and three lakes in the catchment. 11 are artificial or heavily modified. Five per cent of rivers currently achieve good or better ecological status/potential, including the Downside Ditches and Bookham Brook. 11 per cent of rivers assessed for biology are at good or high biological status now, with 44 per cent at poor biological status, and 11 per cent of assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. 25 per cent of rivers in the Mole will improve for at least one element by 2015.

Some key actions for this catchment

- The Environment Agency will undertake farm visits and work with farmers to provide pollution prevention advice and information to ensure farming activities are not causing a detrimental impact on the environment.
- The Environment Agency will investigate improvements to sewage treatment works that could be included in the programme of work under the 2014 periodic review..
- The Environment Agency will install an elver (juvenile eel) ladder at Teddington weir on the River Thames and at Mole Ember weir on the River Mole. This will allow the upstream migration of eel, improving populations of this important, threatened and declining species, in the River Mole (Hersham to the River Thames confluence at East Molesey).
- Throughout the catchment, there is a requirement for further monitoring and investigation to allow targeting of additional measures to improve the status of this catchment.

North Kent catchment



Catchment summary

The North Kent catchment area extends along the North Kent coast between Gillingham in the west and Herne Bay in the east.

The area is made up of the chalk North Downs and due to the permeable nature of the geology, surface watercourses do not cover a large proportion of the landscape. The existing water features have experienced many pressures. During the 1960s major drainage works were undertaken within the enclosed marshes and this led to the creation of large arable fields and a loss of grazing marshes. Urbanisation has resulted in channel modification notably around Sittingbourne,

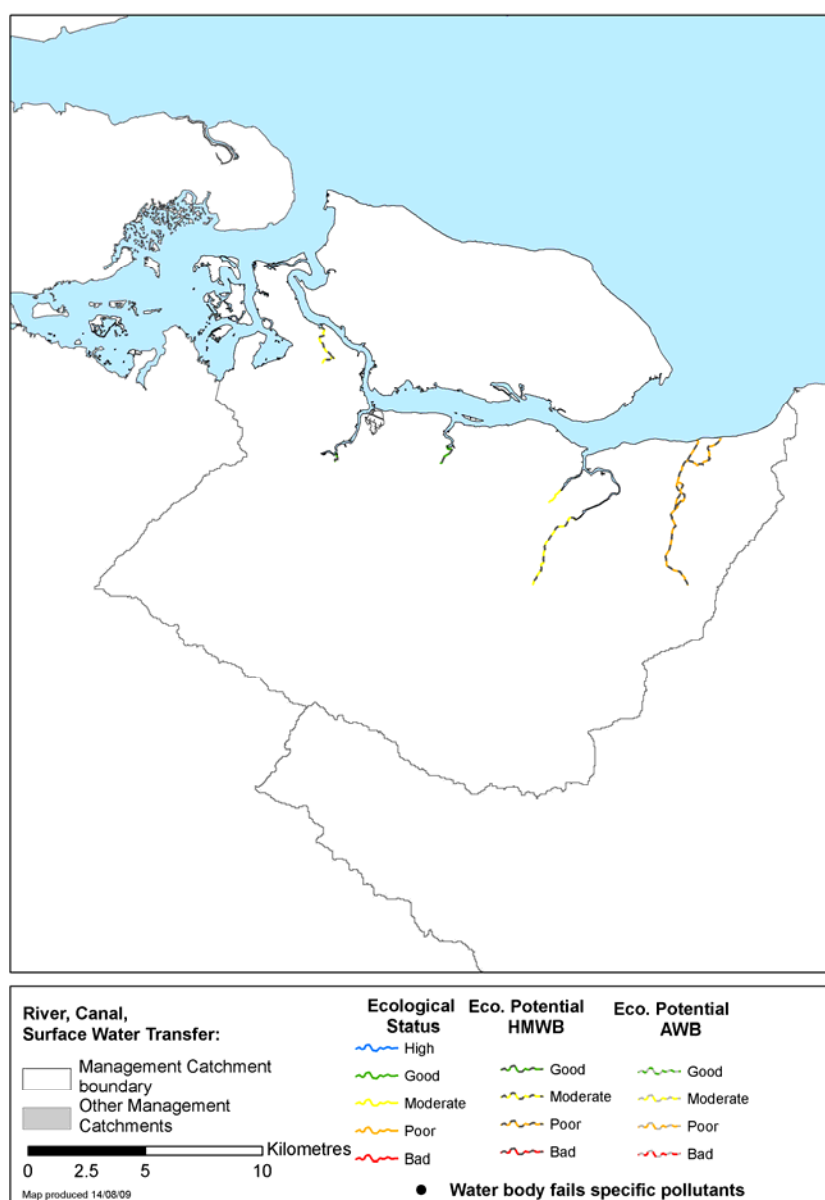
Faversham, Whitstable and Herne Bay. Associated sewage treatment works have all limited the ecology of the chalk springs.

The principal water dependent habitats in this area are the grazing marshes and inter-tidal mud flats. The habitat value of the grazing marsh depends largely on careful surface water management. This area has been designated a Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) in recognition of the bird population which is supported by the inter-tidal mud flats and the grazing marshes.

The springs which feature on the north side flow into the Thames Estuary along very modified channels. Much of the action in this area will be to improve the groundwater quality through addressing diffuse and point source pollution. Water quality has been recognised as a problem and action will be taken in the Periodic Review to improve sewage discharges in the Swale, Frognal Drain, Faversham Creek and Milton Creek.

Improvements in the surface water bodies will also be targeted at reducing physical pressures such as culverts, sluices and concrete banks for example in the Milton, Faversham and Oare Creeks. Many of these surface water bodies require additional biology monitoring to increase confidence in the derived ecological status.

Figure 23 Map showing the current status/potential of rivers in the North Kent catchment



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Table 15 Key statistics for the North Kent catchment at a glance

River and lake water bodies	Now	2015
% at good ecological status or potential	14	14
% assessed at good or high biological status (1 water bodies assessed)	0	0
% assessed at good chemical status (0 water bodies assessed)	0	0
% at good status overall (chemical and ecological)	14	14
% improving for one or more element in rivers		0

There are five river water bodies and two lakes in the catchment. Six are artificial or heavily modified. 20 per cent of rivers currently achieve good or better ecological status/potential. None of

the rivers assessed for biology are at good or high biological status now, with 67 per cent at poor biological status and 33 per cent of assessed river water bodies at bad status.

This plan will address the key pressures in the catchment, and those waters in the worst state will be prioritised. It is unlikely that any of the rivers in the North Kent catchment will improve to good status by 2015.

Some key actions for this catchment

- Southern Water will improve sewage works at nine locations to reduce inputs of nutrients including phosphate and improve shellfish waters.
- The Environment Agency will undertake pollution prevention campaigns and visits around groundwater abstractions to decrease the inputs of nitrates, pesticides, hydrocarbons and solvent. Priority sites include Throwley and Gore.
- Local authorities will aim to reduce the physical impact of urbanisation in artificial or heavily modified water bodies to help waters reach Good Ecological Potential. These water bodies are specified in Annex B.

Roding, Beam and Ingrebourne catchment



Catchment summary

The Roding, Beam and Ingrebourne catchment is located in west Essex and east London. All three river systems rise in rural areas and flow through contrasting rural / agricultural and urban environments which include the towns of Ilford, Barking, Romford, Brentwood, Loughton and Chipping Ongar.

The Roding, Beam and Ingrebourne Rivers are subject to a relatively high degree of environmental stress. The upper reaches receive agricultural run-off, and are at risk from diffuse and point source agricultural pollution, over abstraction and reduced dilution. The lower stretches are strongly influenced by their urban constraints.

The River Roding rises at Molehill Green, east of Stanstead Airport and flows south before its confluence with the Thames at Barking. The geology of the catchment is essentially London clay.

There are numerous surface water agricultural abstractions from the Upper Roding and Cripsey Brook. These abstractions seek to take advantage of the high flows that can occur in the winter months. Nutrient levels in the river can be high due to the flash flow regime that occurs after rainfall events.

Water quality in the Middle and Lower Roding is influenced by misconceptions and urban run-off discharges. Pollution tolerant aquatic species have become more frequent due to these water quality issues.

The Beam is predominantly an urban watercourse, which has been heavily modified by the use of culverts and concrete banks.