# Upper Thames Catchment Management Plan

**Consultation Draft**
**May 2012**

**Creating better places for people to work, live and visit**

# Catchment planning for the Upper Thames Catchment: information and consultation

Implementing the EU Water Framework Directive (WFD) will assist all interested parties in focussing on the management of land and water in a co-ordinated and sustainable way. This will allow for the better balancing of the environmental, economic and social demands. Your feedback about the catchment plan would therefore be appreciated,

Specifically could you please answer the following questions about the Upper Thames Catchment Management Plan and provide any feedback. We want to engage with parties at a catchment level to encourage greater local participation so as to achieve more for communities and the water environment.

**Q1.** What would your vision for the Upper Thames catchment be? For example is there a more specific aspiration than 'Creating Better Places for people to work, live and visit'?

**Q2.** This catchment plan is our first step to implementing a catchment based approach. The assessment of problems in the waterbodies has been agreed by Environment Agency teams. Do you have any issues that need to be addressed to reach our objectives?

**Q3.** We have set out some actions required to meet the objectives. To what extent do you agree the right actions have been identified?

**Q4.** Do you believe there are any missing actions?

**Q5.** Do you have any other comments on this catchment approach?

We will use your comments to help revise proposals, and will produce a revised plan which will be discussed at the next workshop.

Please send your feedback by **June 16th** to:

Oliver Roden
Environment Agency
Red Kite House
Howbery Park
Crowmarsh Gifford
Wallingford
OX10 8BD

Or email: ThW_AEPT@Environment-Agency.gov.uk

If you have any questions or would like to talk about this plan you can also contact me on 01276 454478

Thank you in advance for your help,

Oliver Roden
Upper Thames Catchment Planner

Paul St. Pierre
Upper Thames Environment Management Lead

## Acknowledgements

All maps © Crown copyright and database rights 2012. Ordnance Survey 100024198. Aerial imagery is copyright Getmapping plc, all rights reserved. Licence number 22047. © Environment Agency copyright and/or database rights 2012. All rights reserved.

All photographs © Environment Agency 2012 (unless otherwise stated)

## Notes

If you are providing this plan to an internal or external partner please inform the plan author to ensure you have got the latest information

| Author | Date | What has been altered? |
|---|---|---|
| Ross Agutter | 02/02/2012 | Field Actions updated with aspirational actions (in bold) identified during 28/10/2011 WFD meeting |
| Ross Agutter | 15/02/2012 | Layout, formatting, images |
| Ross Agutter | 16/03/2012 | Replaced old tables with editable ones to ensure the document is easy to update. Also made minor revisions to the body of text |
| Ross Agutter | 02/05/2012 | Modification of the investigation and actions sections, implementation of feedback comments |

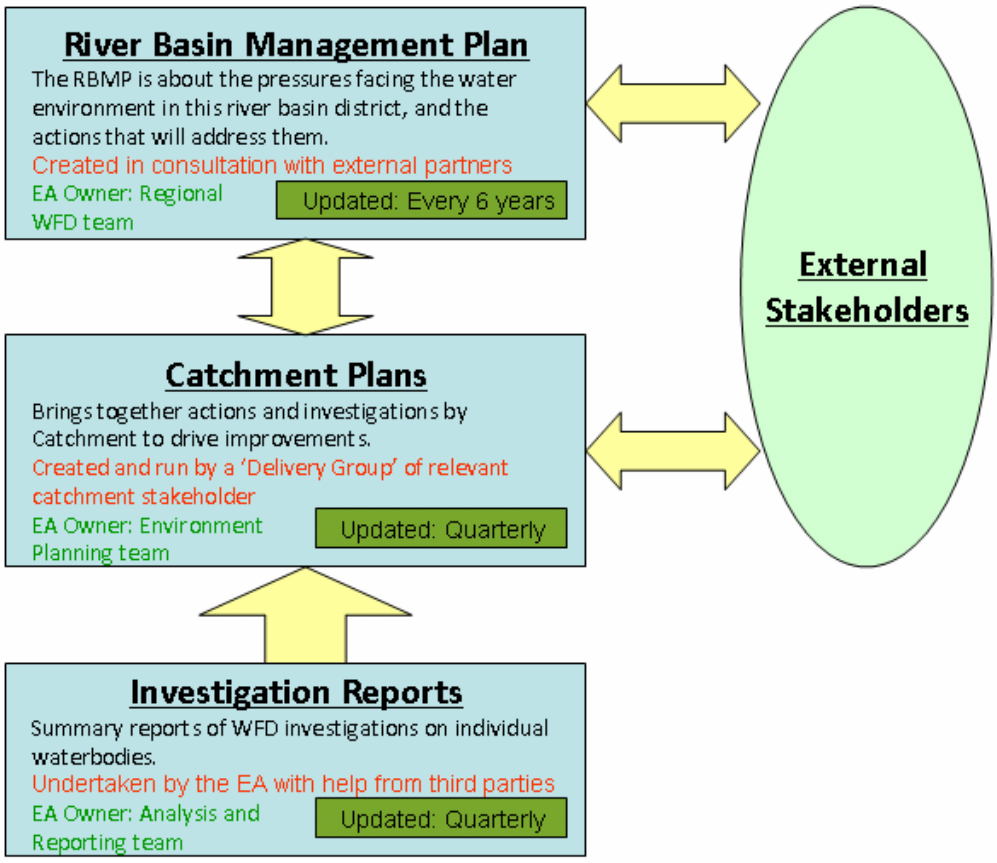
Front page images
Left image: River Coln and fields at Fairford
Top-right image: Swan at Bibury.
Bottom-right image: Rack Isle in Bibury.

# Foreword

This plan identifies the actions needed to achieve the objectives of the Water Framework Directive in the Cherwell catchment as soon as possible. It translates the Thames River Basin Management Plan (RBMP), published in December 2009, into actions required on the ground to achieve Good Ecological Status. The 2009 RBMP forms the baseline which all subsequent investigations and actions are set on.

RBMPs are strategic documents that set out how the water environment will be managed. They are based on cycles of planning and action, and provide a framework for making decisions. They will be reviewed every six years.

River basin planning needs to join up across four levels: National (both England and Wales), river basin district, catchment and local. We, at the Environment Agency (EA), will work with communities and partners at all levels to ensure decisions at one level inform planning at another.




This version of the plan has been compiled by the Environment Agency based on WFD evidence currently held as well information from partnerships ongoing in the catchment. However, we want it to be a collaborative plan produced by local stakeholders. It will not be put in place until all partners have been consulted and their views taken on board. Additionally it will be a 'live' plan which will be continually updated. This will be to record progress in reaching Good Ecological Status\Potential and to allow the plan to adapt to the needs of catchment stakeholders and any associated plans (e.g. BAP etc).

Although this plan focuses on the delivery of the WFD, it will not necessarily preclude or become a greater priority over other objectives within the catchment. Work which may be required to support the wider environment and site specific targets (e.g. Sites of Special

Scientific Interest, flood alleviation plans) may be dealt with in separate documents, which, where appropriate will be referenced in this plan and also in Appendix 5.

This is the local plan to drive delivery and summarises the programme of work to achieve good ecological status in the catchment. This includes investigations and individual actions at waterbody level. The detailed evidence to support actions in place or suggested through this plan are contained within investigation reports. These reports may be either waterbody specific or at a wider catchment level such as habitat restoration strategies.

Using investigations, actions and local knowledge a prediction for each waterbody for attaining good ecological status is included in Table 3.1. This effectively provides a target against which progress can be monitored as investigations and actions are implemented.

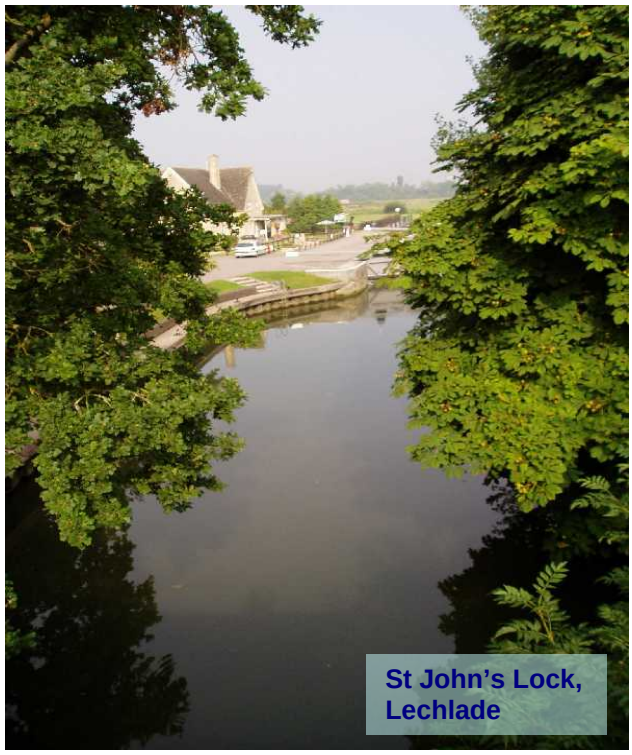
# Contents

# 1. Characterisation of the Catchment

## 1.1. Introduction

The Upper Thames catchment includes stretches of the River Thames extending from its source South East of Cirencester at Kemble to Lechlade in the Cotswolds (Figure 1.1). The largest tributaries are the Coln, the Ray (Wilts), the Churn and the Cole.

The north of the catchment is within the Cotswold District Council and Gloucester County Council, whilst the area to the south of the catchment is within Wiltshire County Council, Swindon Borough Council and the far south east borders are within the Vale of White Horse District Council.


St John's Lock, Lechlade

The catchment is predominantly rural in character. The northern part of the catchment falls within the Cotswolds Area of Outstanding Natural Beauty and the southern catchments fall partly within the North Wessex Downs Area of Outstanding Natural Beauty.
The principal towns are Swindon and Cirencester, however there are many smaller market towns located throughout the catchment.

The area contains a wide variety of habitats and landscapes and provides high quality game and coarse angling in both rivers and still waters. The limestone streams to the north of the area, including the Rivers Coln, Churn and the Ampney Brook, contain predominantly wild brown trout and grayling populations, though the lower reaches also contain important coarse fish populations and habitats. Many of the watercourses are stocked by their owners and angling associations, to supplement wild stock levels. The River Thames and its tributaries to the south are predominantly coarse fisheries, as are the still waters that form the Cotswold Water Park.

The underlying geology of the central area of the catchment, extending from Purton in the west to Lechlade in the east is characterised by clay. This results in the flow regime of the watercourse being predominantly driven by runoff inputs with rapid response to rainfall episodes. The northern area in the Cotswold hills is characterised by limestone which is a store of groundwater. A line of Kimmeridge clay stretches from the south east to the north east of Swindon and out into the Vale of the White Horse hills. There are also drift deposits stretching across the central region of the catchment along the River Thames reaches. These are particularly relevant to local groundwater resources.

The River Coln is groundwater fed river, sourced to the east of Cheltenham from limestone springs which overlay clays. The predominant land use in the area is farming and the area is mostly rural. There are no large towns in this catchment but a number of villages. Flow in the Upper Coln is derived mainly from groundwater supplied limestone so the flow is stable with slow response to winter rainfall events. Summer flow is maintained by the groundwater even in dry years. The Dudgrove Brook and Thornhill Brook join the river downstream of Fairford and contribute surface water runoff to the river flow. It converges with the Thames west of Lechlade.

The River Churn is also a spring fed river, it rises south of Cheltenham and flows through Cirencester to its confluence with the River Thames at Cricklade. The Upper Churn catchment is mostly rural, the predominant land use being farming. Flows in the upper reaches can fall to very low levels during the summer. This is because the aquifers release water quickly and so in response to little or no rainfall the base flow supplied to the river will be very small. Its middle and lower reaches are influenced by the Cirencester urban area as it passes through the town. As it passes through Cirencester (12.4km from the Thames confluence), the Churn crosses the aforementioned geological boundary, transiting from flowing over limestone to clay. This results in the main contribution of the river flow shifting from groundwater to surface run-off. During winter groundwater can still be a significant contributor to flows. Throughout the summer months there are concerns along the Churn over low flows, exacerbated by the effect of abstraction. A number of mills and weirs have also affected the channel.

The River Cole is a highly modified clay river which has been subject to considerable flood defence and land drainage engineering in the past, a condition exacerbated by the impact of rapid and at times poor quality run-off from the substantial urban area of Swindon at its headwaters. The majority of land management in the catchment is intensive although there are a number of semi-improved pastures and wetland habitats, the latter on the fringes of Swindon. Perhaps as a result of its flashy nature, the Cole does show some geomorphic features such as berms, earth cliffs and slumps, but in the upstream reaches tends to be shaded by bank-side and bank-top vegetation precluding much in the way of aquatic and marginal plants. A number of smaller streams of variable ecological quality flow into the Cole, the most interesting of which is the downstream section of the Tuckmill Brook which has a diversity of channel features meandering through marshy floodplain between river terrace features.

The River Ray is a heavily modified clay river that rises at the large conurbation of Swindon. Unlike the Cole, the River Ray receives effluent from a large sewage treatment works (STW) which serves to sustain flows. Until recent improvements the STW effluent was a significant factor in limiting the ecological value of the watercourse. All the main river tributary streams of the Ray are small watercourses flowing in part or wholly through urban areas and in the most part are heavily shaded by bankside vegetation. The Ray, downstream of Swindon, flows through a mainly pastoral floodplain landscape with improved hay meadow grasslands. There is moderate diversity of channel and marginal vegetation in the lower Ray, and the river does display a number of geomorphic features despite the highly modified nature.

It is likely that the greatest pressure on the water environment now and in the future will be from growth and housing development. The large quantities of houses proposed around Swindon (4,500 homes in the south, 10,000 to the north and 12,000 in the east) and increase in population have the potential to increase pressure on the water environment during and post construction. These potential threats to the water environment should be mitigated by planning processes, catchment abstraction management strategies (CAMS) and water quality permitting.

River Ray at Water Eaton

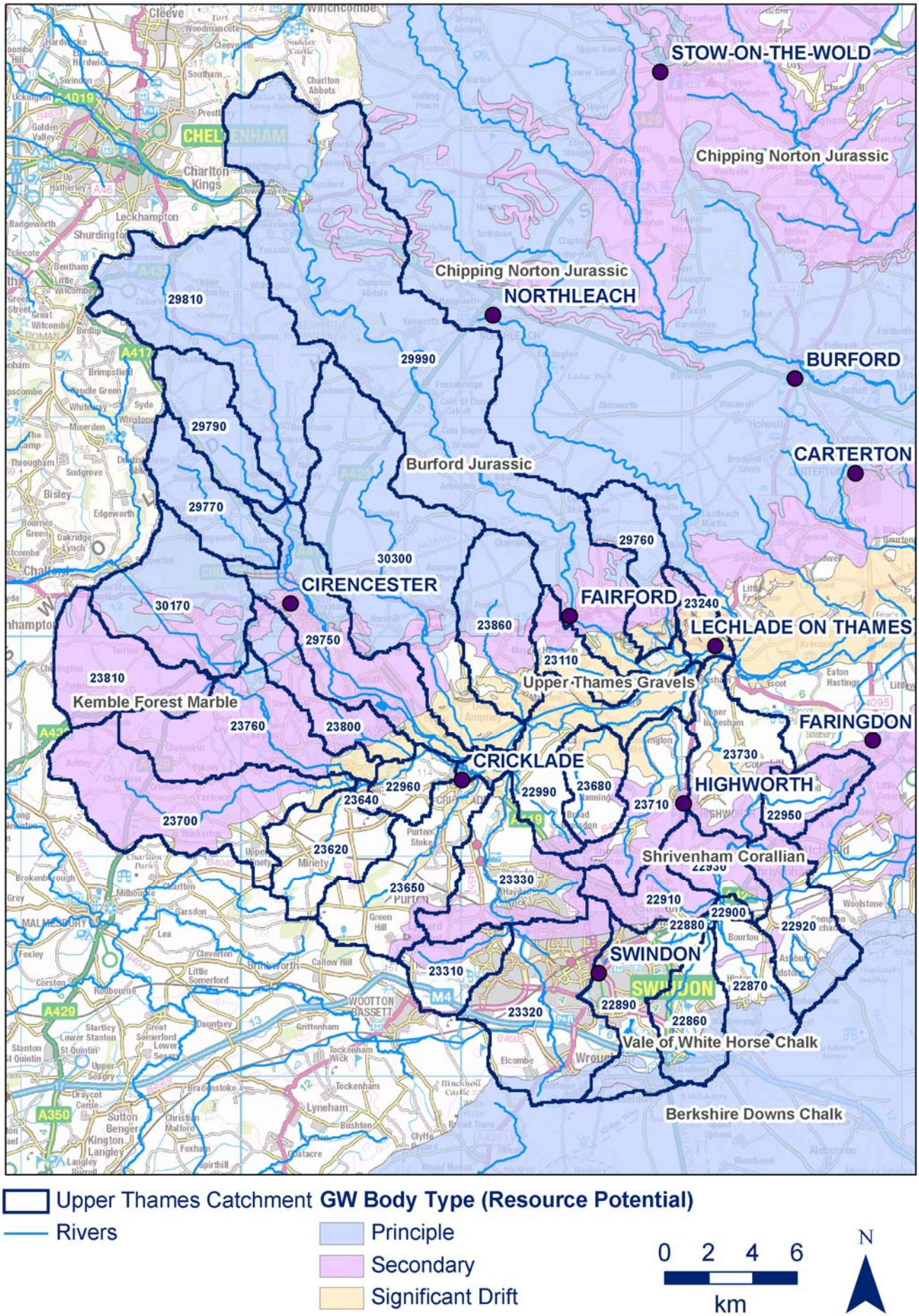



**Figure 1.1 Upper Thames catchment including RBMP surface and groundwater bodies**

### *1.1.1. Location and description of any freshwater protected areas*

There are a number of Sites of Special Scientific Interest (SSSI) in the Upper Thames catchment which are dependant on local hydrology. Floodplain meadows, woods and quarries are habitats characteristic of the SSSI's; a few examples of which are the Cotswold Water Park, Barnsley Warren, and Elmlea Meadows. There is one Special Area of Conservation within the catchment, a wetland named North Meadow and Clattinger Farm' located near Cricklade.

The condition of Coate Water SSSI was assessed by Natural England as "unfavourable no change" in 2004. The reasons for the unfavourable assessment were siltation and water pollution from discharges. However, the condition of biota for which this SSSI is designated is deemed to be healthy and further investigation into the pollution from a domestic septic tank is underway, but is not deemed likely to be having a significant impact.

The condition of the Cotswold Water Park SSSI was assessed by Natural England as "unfavourable declining" in 2003 and on a number of occasions in 2009. The reasons given for the unfavourable assessment were water pollution from agriculture, run off and discharges, eutrophication and shading from trees.

Six rivers within the catchment hold 25 freshwater fish designations, legislation that aims to protect and improve the water quality of rivers and lakes to encourage healthy fish populations through monitoring and enforcing standards. The catchment has many reaches that are important salmonid and coarse fisheries. These stretches have water quality and monitoring standards set that will be superseded by the Water framework Directive in 2013.

There is one bathing water within the catchment, located in the Cotswold Water Park. This is currently passing Bathing Water Directive standards and is expected to be assessed as 'good' under the revised Bathing Water Directive.

There are no drinking water protected areas at risk of failing the requirements of the Drinking Water Directive in the catchment.

Nitrate Vulnerable Zones are areas of land overlying important drinking water sources at risk from nitrate pollution. Farmers with land in these areas must follow mandatory rules to tackle nitrate loss from agriculture. The whole Upper Thames catchment has been designated a Nitrate Vulnerable Zone since 2002.

The Urban Waste Water Treatment Directive (UWWTD) aims to protect the environment from the adverse effect of waste water. All UWWTD discharges in nutrient sensitive areas within the catchment are compliant with the required standards (2 mg/l total phosphorous and 15mg/l total nitrogen for population equivalent below 100,000 and 1 mg/l total phosphorous and 10mg/l total nitrogen for over 100000)).

### *1.1.2. Important additional features and pressures*

Land use in the Upper Thames catchment (Figure 1.2) is predominantly agricultural. Arable land use makes up 43% of the catchment, 29% is grassland and a further 15% is urban. The remaining 13% is occupied by woodland and other uses.

Seven waterbodies within the catchment are identified as 'at risk' from diffuse pollution from agriculture. These are the Liden Brook, Swindon; Tuckmill Brook and tributaries; Lydiard and Shaw Brooks at Swindon; Derry Brook and Leighfield Brook ;Key (Source to Thames) Cerney Wick Brook (source to Thames); Ampney and Poulton Brooks (Source to Thames).

Water resources in the area are highly managed, with a large number of abstractions from both rivers and groundwater sources including 12 for public water supply. In consultation with the Environment Agency, Thames Water closed their abstraction at Worsham in 2002, and agreed reductions and changes to water abstraction licences at Meysey Hampton, Latton and Baunton in 2005. These changes are expected to result in improved flows in the Ampney Brook and River Churn.

Thames Water's licensed quantities at Latton have been reduced to 20Ml/d in 2007 following AMP3 investigations into low flows in the River Churn and Ampney Brook. There is a flow constraint written into the Meysey Hampton licence which is designed to protect the Coln when flows are naturally lower. The flow constraint is set high, and the licenced daily abstraction represents only 15% of the 68 Ml/d flow constraint. In practice, this limits the Inferior licence to abstracting in winter months only. One of the two abstraction licences at Baunton was revoked in 2008

There are pockets of contaminated land within the catchment. These areas are more prevalent around the larger towns of Swindon and Cirencester.

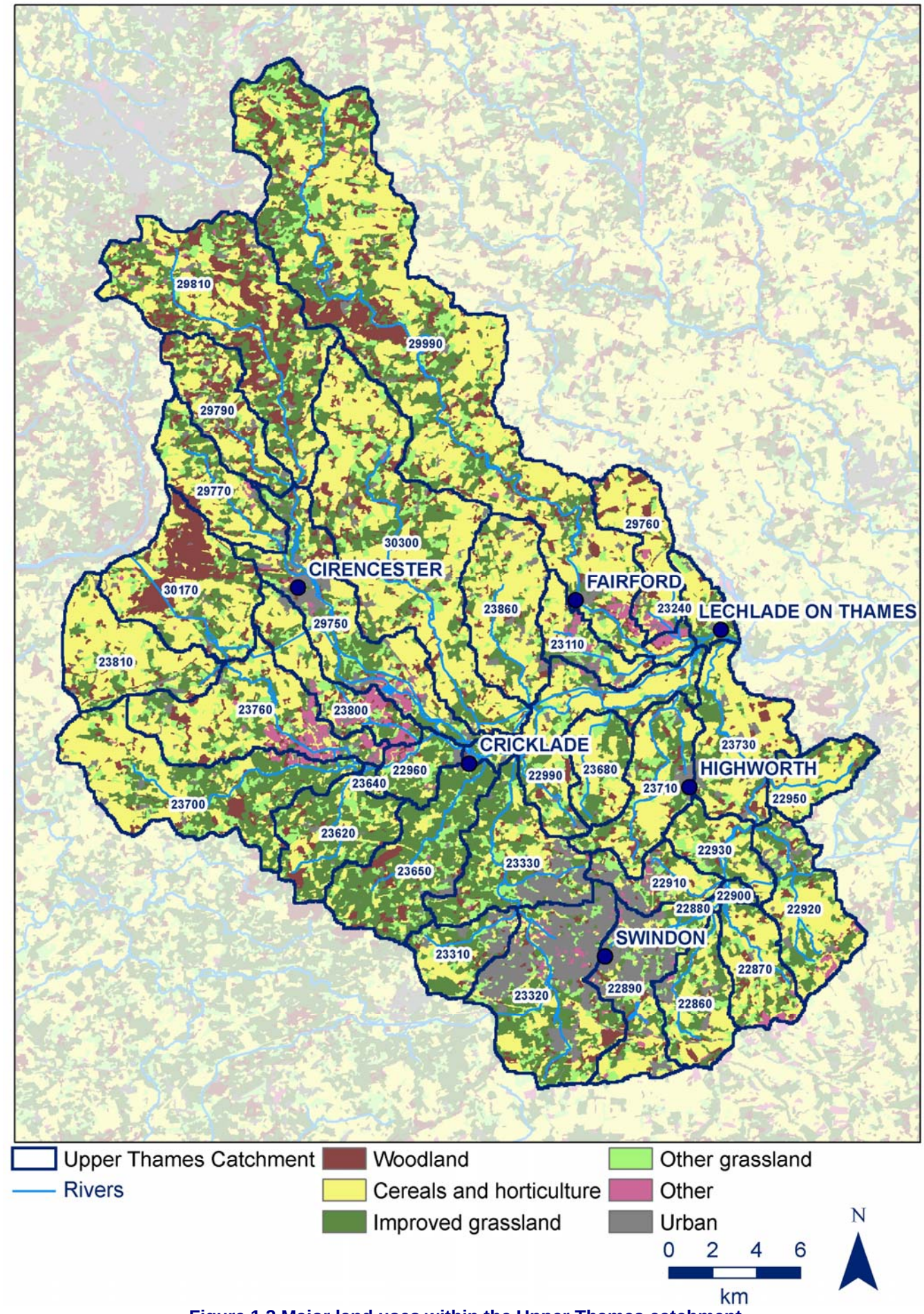



**Figure 1.2 Major land uses within the Upper Thames catchment**

## 1.2. Overview of water bodies and WFD characterisation

### *1.2.1. Annual Classification Updates*

The investigations and actions within this plan were originally set out to address the issues identified in the Thames River Basin Management Plan published in 2009. Since then monitoring of relevant elements in the waterbodies has continued and is being reported annually. These 'interim' classifications are not official compliance statuses. Instead they are used to help improve our data, feed into investigations and indicate where there is improvement or potential deterioration. The 'interim' waterbody classifications for 2011 are included in Table 1.1 and Figure 1.3 to show the catchments progress towards Good Ecological Status.

As we require an understanding of how rivers are progressing toward good ecological status on an annual basis. We have decided to adopt a fixed network of sampling points within all those water bodies required to be monitored. Using this monitoring network will enable us to report the annual classification and understand year on year changes, with a known confidence. This new network is called the Ecological Status Indicator (ESI). It describes, with a known level of confidence, the annual change in the number of waterbodies at good ecological status. The ESI will be built into our annual WFD Classification update. This will commence in June 2012.

### *1.2.2. Overview of current status*

The Upper Thames catchment has 35 surface water bodies as shown in Figure 1.1 and Figure 1.3. Two water bodies, are designated as 'heavily modified' under WFD criteria.

- Waterbody No: 22890 Cole and Dorcan Brook (Source to Liden Brook confluence), which is heavily modified because of flood protection purposes. This waterbody has good ecological potential.
- Waterbody No: 23240 Thames (Coln to Leach ), is heavily modified because of navigation reasons so is currently at moderate status.

Of the 33 water bodies not designated as 'heavily modified' under WFD criteria, one has been classified as 'bad' status, ten as 'poor' status, twelve as 'moderate' status and ten are classified as 'good' status. This is illustrated in Figure 1.3

The classifications have been based on the available monitoring data for the four WFD biological factors (fish, invertebrates, macrophytes and phytobenthos) and a suite of water quality factors as shown in Table 1.1

Of the seven groundwater bodies (Figure 1.4), six are classed as being Poor Chemical Status (with failures relating to nitrates and ammonia). The Burford Jurassic ground waterbody is classed as Poor Quantitative Status. The overall status for ground waterbodies are determined by the worst case for both qualitative and quantitative measures (i.e. Good qualitative and poor quantitative status will lead to an overall status of Poor).

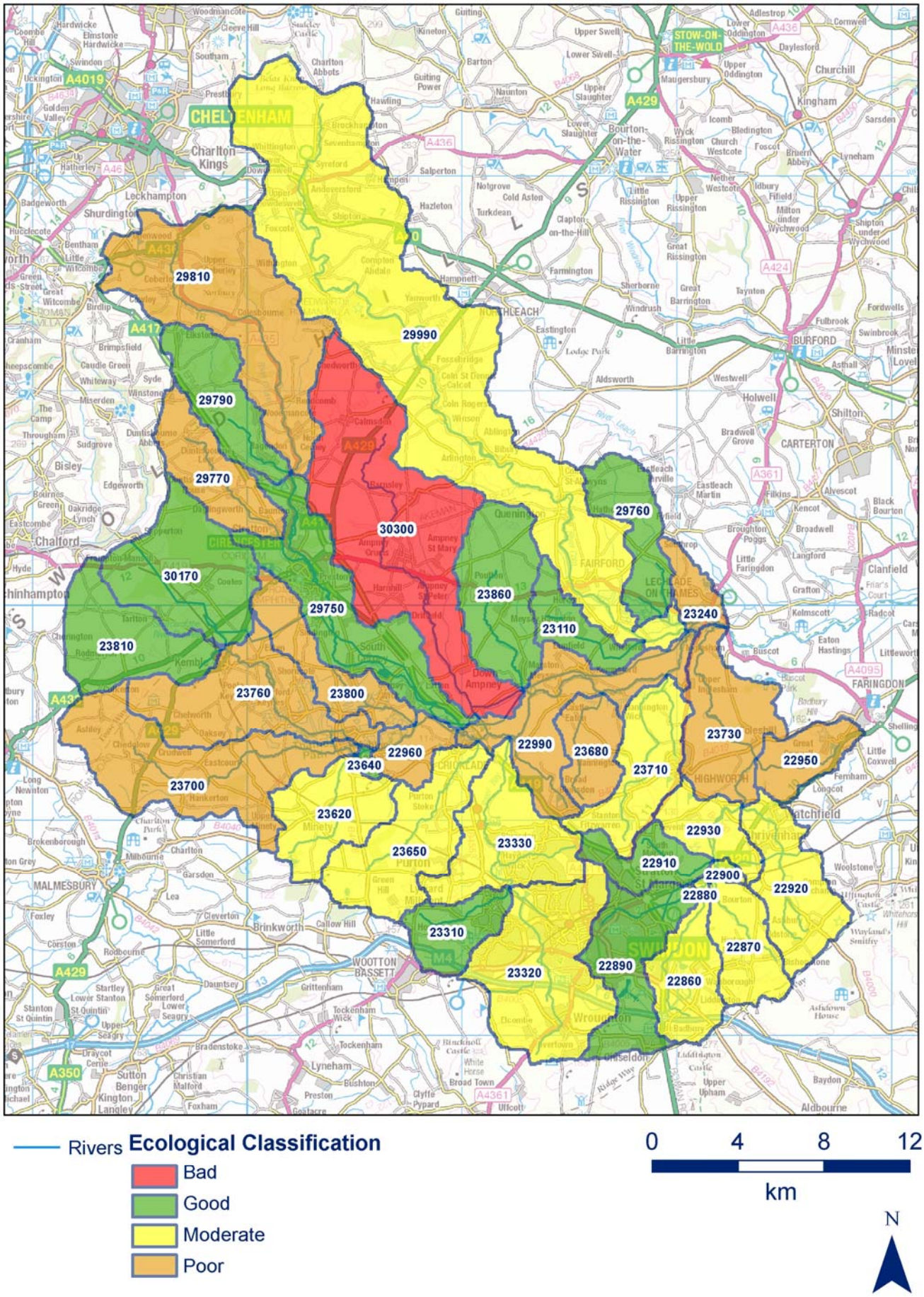



**Figure 1.3 Ecological status in the Upper Thames catchment as reported in the Thames RBMP**

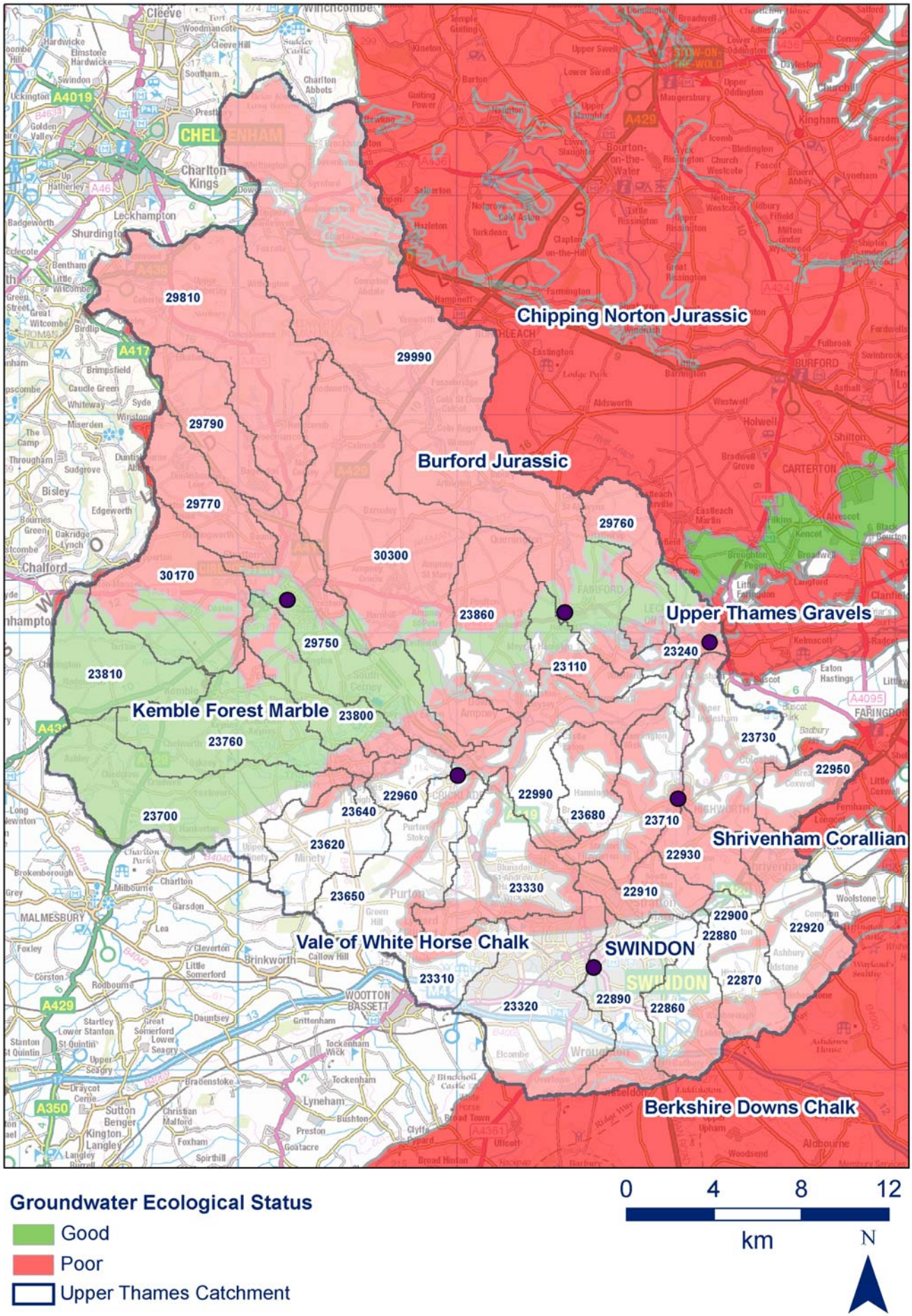



**Figure 1.4 Overall status of groundwater bodies in the RBMP**

**Table 1.1 Factors determining waterbody classifications***

| | |
|---|---|
| No Data | Good |
| Bad | Moderate |
| Poor | High |
| VC = Very Certain | QC = Quite Certain / UC = Uncertain |

| WB code (GB1060390…) | WB name/ Ecological Status | Classification Driver (i.e. parameter(s) that determine classification) | Phytobenthos | Macrophytes | Invertebrates | Fish | Ammonia | DO | pH | P | Temp | Chemicals | GWB (i) | Chemical GWB in catchment Quantitative in WB | GWB (ii) | Chemical GWB in catchment | Quantitative in catchment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23650 | Key (Source to Thames) | Phosphate, Phytobenthos | | | QC | | QC | UC | | VC | | QC | | | | | |
| 23640 | Swill Brook and Thames (High Bridge to Waterhay Bridge) | Morphology, Hydrology | | | | | | | | UC | | | | | | | |
| 22900 | Cole (Acorn Bridge to South Marston Brook) | Phosphate, Invertebrates | | | QC | | | | | VC | UC | | | | | | |
| 22880 | Cole (Liden Brook to Lenta Brook) | Phosphate | | | | VC | | | | QC | | | | | | | |
| 29990 | Coln (Source to Thames) | Fish, Macrophytes | | UC | | VC | | | | | | | Burford Jurassic | Poor (NO3) but NOT in this catchment area | Good | Kemble Forest Marble | Good | Good |
| 30170 | Thames (Source to Kemble) | Dissolved Oxygen | | | | | | | | | | | | | | | |
| 23860 | Marston Meysey Brook | Invertebrates | | | | | | | | | UC | | | | | | |
| 29760 | Thornhill Ditch and tributaries at Cotswolds Water Park | Hydrology, Morphology | | | | | | | | | | | | | | | |
| 30300 | Ampney and Poulton Brooks (Source to Thames) | Fish | | | | UC | | | | | | | | | Upper Thames Gravels | Poor | Good |
| 29770 | Daglingworth Stream (Source to Churn) | Fish | | | | VC | | | | | | | | | | | |
| 29790 | Elkstone Brook | Hydrology, Morphology | | | | | | | | | | | | | | | |
| 29810 | Churn (source to Perrots Brook) | Phytobenthos | VC | UC | | VC | | | | | UC | | | | | | |
| 29750 | Churn (Baunton to Cricklade) | Invertebrates, Fish | | | QC | UC | | UC | | | UC | | Kemble Forest Marble | Good | Good | Burford Jurassic | Poor | Good |
| 23680 | Share ditch | Phytobenthos | VC | | | | | UC | | VC | | | | | | Shivenham Coralian | Poor | Good |
| 23700 | Swill Brook (source to Ashton Keynes) | Fish | | | | QC | | UC | | | UC | | | | | | | |

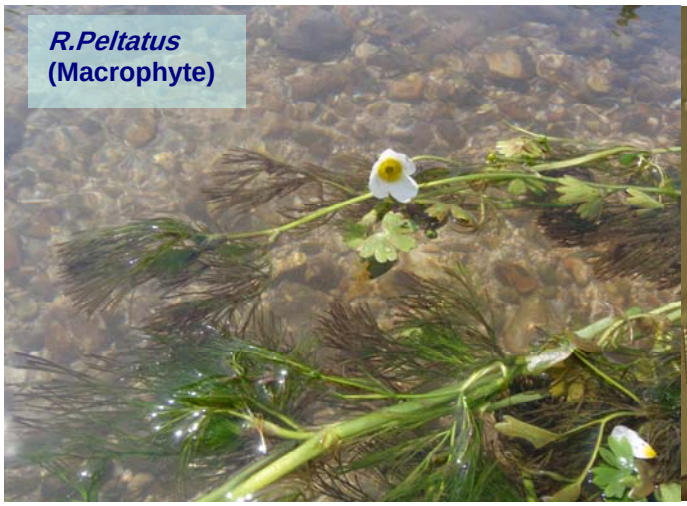
| WB code (GB1060390…) | WB name/ Ecological Status | Classification Driver (i.e. parameter(s) that determine classification) | Phytobenthos | Macrophytes | Invertebrates | Fish | Ammonia | DO | pH | P | Temp | Chemicals | GWB (i) | Chemical GWB in catchment | Quantitative in WB | GWB (ii) | Chemical GWB in catchment | Quantitative in catchment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23760 | Thames (Kemble to Waterhay Bridge) | Fish | | | | QC | | UC | | | | UC | Shivenham Coralian | Poor (SW tests affect this catchment | Good | | | |
| 22920 | Tuckmill Brook and tributaries | Phosphate | | | | | | UC | | UC | UC | | | | | | | |
| 23810 | Kemble Ditch at Kemble | Dissolved Oxygen | | | | | | | | | | | | | | | | |
| 23710 | Bydemill Brook (Source to Thames) | Phosphate, Ammonia (Phys-Chem), Invertebrates | | | UC | QC | VC | UC | | VC | UC | VC | | | | Upper Thames Gravels | Poor | Good |
| 23800 | Cerney Wick Brook (source to Thames) | Fish | | | | VC | | | | VC | UC | | | | | Vale of White Horse chalk | Poor | Poor |
| 23730 | Cole (Bower Bridge to Thames) including Coleshill | Phytobenthos | VC | | | UC | | | | VC | | VC | | | | | | |
| 22910 | South Marston Brook to Swindon | Phosphate, Invertebrates | | | QC | | | | | | UC | | | | | | | |
| 22930 | Cole and tributaries at Sevenhampton | Phosphate | | | | | | | | QC | | | | | | | | |
| 22950 | Waterloo Ditch (East of Coleshill) | Invertebrates | | | QC | | | | | QC | | | | | | | | |
| 23310 | Lydiard and Shaw Brooks at Swindon | Phosphate, Invertebrates | | | | | | UC | | | UC | | | | | | | |
| 23330 | Ray (Wiltshire): Lydiard Brook to Thames | Phosphate, Ammonia (Phys-Chem), Invertebrates | | | | | | UC | | VC | UC | | | | | | | |
| 23240 | Thames (Coln to Leach) - HMWB | Phytobenthos | | | | | | | | | | | Upper Thames gravels | Poor ($NO_3$) in this catchment plan area | Good | Kemble Forest Marble | Good | Good |
| 23110 | Dudgrove Brook | Phosphate, Invertebrates | | | | | | | | | UC | | | | | | | |
| 22990 | Thames (Churn to Coln) | Phytobenthos | VC | | | UC | | UC | | VC | | | | | | | | |
| 22960 | Thames (Waterhaybridge to Cricklade) and Chelworth Brook | Fish | | | | QC | | UC | | | | | | | | | | |
| 23620 | Derry Brook and Leighfield Brook | Invertebrates | | | QC | | | | | | | | | | | | | |
| 23320 | Ray (Wiltshire) source to Lydiard Brook | Phosphate | | | | | | | | | UC | | White Horse | relate to other | Poor | Shivenham Coralian | Poor | Good |
| 22860 | Liden Brook, Swindon | Phosphate | | | | | | UC | | VC | UC | | | | | | | |

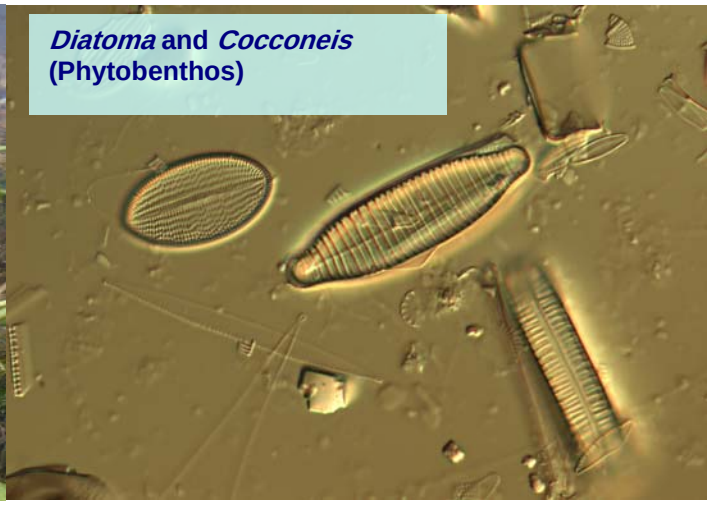
| WB code (GB1060390…) | WB name/ Ecological Status | Classification Driver (i.e. parameter(s) that determine classification) | Phytobenthos | Macrophytes | Invertebrates | Fish | Ammonia | DO | pH | P | Temp | Chemicals | GWB (i) | Chemical GWB in catchment | Quantitative in WB | GWB (ii) | Chemical GWB in catchment | Quantitative in catchment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22870 | Lenta Brook, East of Swindon | Phytobenthos | VC | | | | | | | | | | | | | | | |
| 22890 | Cole and Dorcan Brook (Source to Liden Brook confluence) - HMWB | Phosphate, Mitigation Measures Assessment | | | | | | | | | | | | | | | | |

*Classifications are based on 2011 data. For more information on the classification procedure please refer to Appendix 4

## *The Biological Elements*





### *1.2.3. Catchment summary*

On the basis of the WFD monitoring information, the condition of the Upper Thames catchment can be summarised as below:

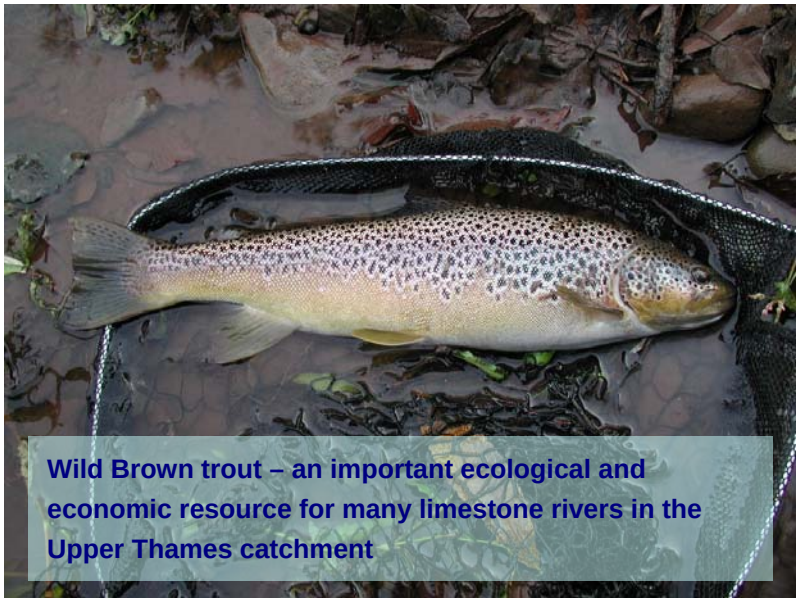
- There is great variation in the condition of the rivers within this catchment.
- Most waterbodies (65%) are at good or moderate ecological status.
- There is great uncertainty over both the condition of the rivers and the actions needed to improve them.

Before committing to improvement actions, it is important to review the quality of the information on which the condition of the catchment has been based. This will help to confirm the need for further investigation, and identify where this should be target.

### *1.2.4. Review of information quality and new data requirements*

Table 1.1 shows that failure to meet good ecological status is primarily a result of the status' of the following:

• Phosphorus concentrations
• Fish
• Invertebrates
• Hydromorphology
• Phytobenthos



**Wild Brown trout – an important ecological and economic resource for many limestone rivers in the Upper Thames catchment**

The water quality information is reasonably comprehensive. 94% of the water bodies have been analysed for the full water quality suite of chemicals. There is no data available for two water bodies – the Thames (Coln to Leach): No 23240 and the Derry Brook and Leighfield Brook: No 23620.

The biological information is sparse for macrophytes and phytobenthos. Just three water bodies have been measured for macrophytes and seven waterbodies for phytobenthos.

The lack of monitoring information for some biological elements is an issue, both for understanding the problems and for identifying what actions are needed to deal with them. This will be addressed through additional monitoring and investigation to be pursued through this plan, in order to provide a robust evidence base.

<u>Conclusions</u>
The water bodies to the north and east of Swindon (22860, 22920, 22900, 22930) all indicate phosphates as the reason for 'moderate' status.

- The one waterbody with 'bad' status is located to the east of Cirencester in the Cotswolds. This is the 'Ampney and Poulton Brooks (Source to Thames)'. The reason for the classification is due to fish failures.
- The Lydiard and Shaw Brooks at Swindon need further investigation to improve the confidence in their current 'good' ecological status

The RBMP indicates that Good Ecological Status can be achieved by 2015 in fifteen of the waterbodies in this catchment. Twelve of these are currently at GES, the three remaining waterbodies being No 22950 Waterloo Ditch (East of Coleshill), No 23320 Ray (Wiltshire) source to Lydiard Brook and No 23700: Swill Brook (source to Ashton Keynes). For the remainder, achievement of good status by 2015 is likely to be either disproportionately expensive and/or technically infeasible. At these waterbodies GES will be achieved by 2027.

## 1.3. Prioritising Waterbodies

To help target resources more effectively within the Environment Agency we have prioritised surface water bodies for the Thames and South East river basins. Based on progress towards WFD delivery, each waterbody is categorised into one of the following six priorities:

**Table 1.2 Criteria for prioritizing waterbodies**

| | |
|---|---|
| **Top priority** | Those waterbodies where there is a commitment to delivery by 2015. |
| **Very high priority** | Those waterbodies where there is confidence there is an ecological failure, the reasons are understood and why they are of bad or poor biological status. |
| **High priority** | Those waterbodies where there is confidence there is an ecological failure, the reasons are understood and why they are of moderate or better biological status. |
| **Medium priority** | Those waterbodies where there is still a need to confirm the ecological failure or understand the reasons for the failure, and they are of bad or poor biological status. |
| **Lowest priority** | Those waterbodies where there is still a need to confirm the ecological failure or understand the reasons for the failure, and they are of moderate or better biological status. |
| **Compliant** | Those waterbodies which are currently of GES |

The list will be updated at least every six months to account for changes in waterbody status, investigations, actions underway and third party requirements. For the Upper Thames catchment there are:

2 Top Priority waterbodies
5 Very High Priority waterbodies
4 High Priority waterbodies
5 Medium Priority waterbodies
10 Lowest Priority waterbodies
9 Compliant waterbodies

Although these priority waterbodies will be used to help target EA resources it is only a guide. As such we will help our partners improvement their catchment when required regardless of the priority status of the waterbody.

## 1.4. Uncertainty and Further Investigation

The current analysis of the condition of the catchment has identified some uncertainties which will require further investigation. Uncertainties for each waterbody are illustrated by a 'UC' in Table 1.1.

The greatest level of uncertainty lies with the parameters of temperature, dissolved oxygen levels, fish and invertebrate populations.

- Uncertainties with temperature and dissolved oxygen - There are seventeen sites with uncertainties for either temperature or dissolved oxygen, or both. Five sites have 'operational monitoring' planned to collect data which should help to address these uncertainties. Twelve sites do not have any further monitoring planned at this stage, however, we believe we hold enough information on these sites to be certain of their status in the future.
- There is significant uncertainty regarding fish populations due to a very limited set of survey data
- Six sites currently achieving good ecological status have uncertainties relating to biological and chemical status. Further investigation is likely to involve the analysis of information already held by the Environment Agency. This should help to increase certainty in future.

### *1.4.1. Investigations*

In line with the WFD process all failing elements and reasons will be investigated. Following the weight of evidence requirements all confirmation of failures and reasons have to be certain to drive any actions. Additional evidence maybe required to support expensive actions (e.g. confirmed biological evidence of eutrophication for improvements to sewage treatment works). Investigations are run in three stages. First failures reported in the Thames RBMP have to be confirmed (Stage 1), then the reason(s) for the failure have to be identified (Stage 2). Then the final stage involves identifying all the potential options

Following with the classification results shown in Table 1.1, we are reviewing 8 compliance elements and 5 reasons for failure in the Upper Thames catchment (Figure 1.6 & Figure 1.7). The investigations will include operational monitoring, undertaken by the EA, as well as bespoke investigations tailored to the waterbodies and elements under review.

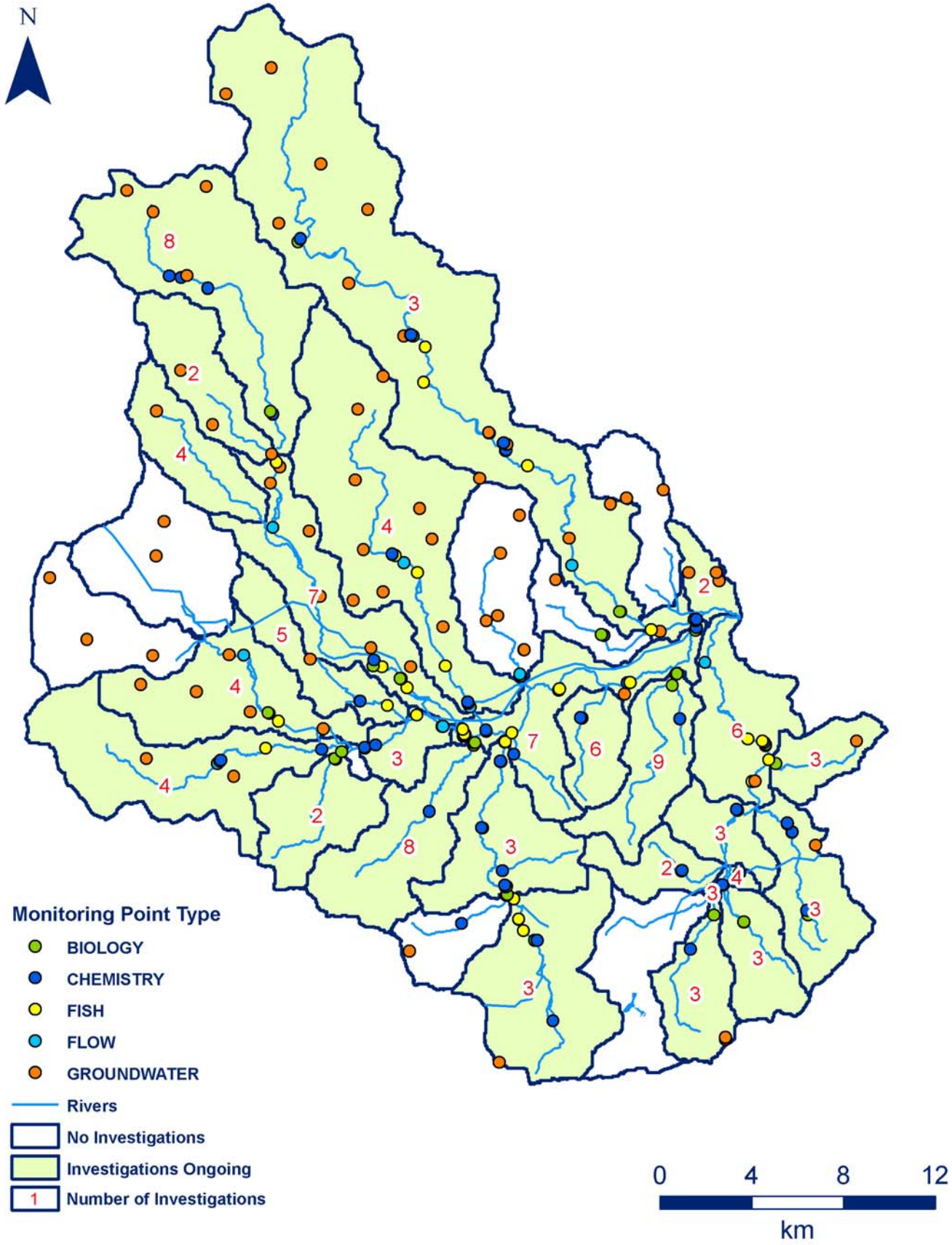



**Figure 1.5 Waterbodies in the Upper Thames catchment with WFD Investigations.**

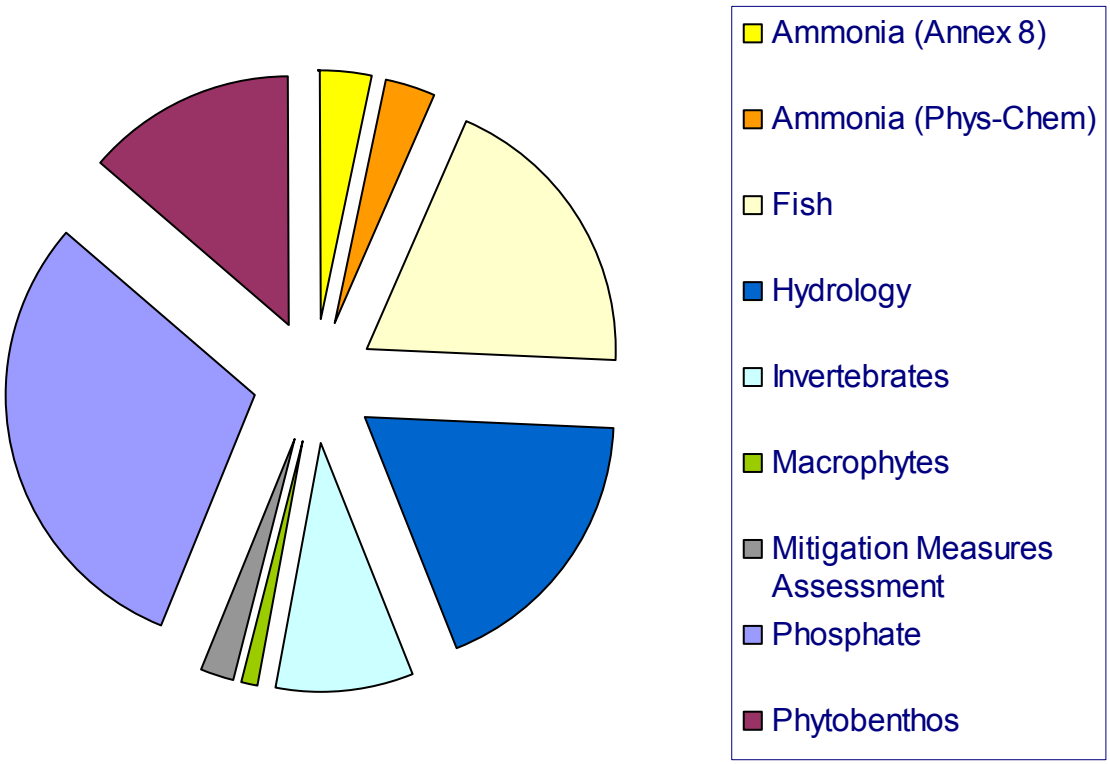



**Figure 1.6 Elements being investigated in the Upper Thames catchment. The size of the wedges is relative to the number of investigations into that factor.**

A review of the relationship between issues and reasons for failures was undertaken as part of a catchment level assessment to identify potential actions. The review revealed a wide range of causes. For the Upper Thames catchment this highlighted 6 significant pressures causing failures. There are also currently eight failures where the cause is unknown

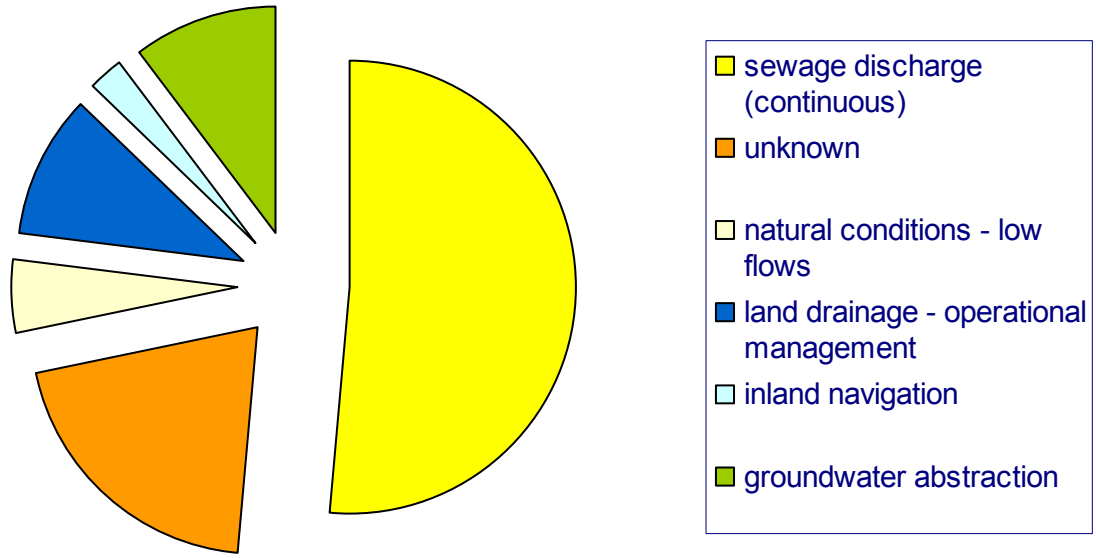



**Figure 1.7 Significant reasons for failures under investigation in the Upper Thames catchment.**

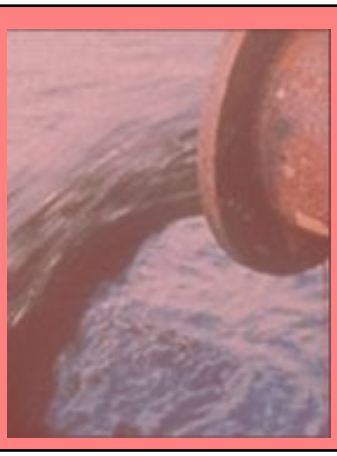
Habitat loss through the pressure of physical modification to the river remains a issue pertinent to the catchment (Nine waterbodies identify physical modification as a surface water management issue). Aside from the land drainage and inland navigation sections, this is not immediately clear in the currently identified reasons for failure (Figure 1.7). This is likely to be

due to the fact that in a number of cases, ongoing fluvial audits need to be completed before the exact reason for failure can be identified. Physical modification is a pressure on fish, macrophytes and invertebrates across the catchment. It is for this reason that a number of actions are aimed at tackling issues arising from physical modification (Section 2.2.4)

### 1.4.2. *Identifying actions required (i.e. Stage 3 investigations)*

Once the reasons for the failures have been identified a further investigation will be required to identify the options for tackling them. This further Stage will identify a raft of potential actions which could be put in place to tackle the issues. What actions do finally get put in place will be dependant upon stakeholder agreement and the actions passing a cost benefit analysis test.

All the Stage 1 (confirm failure) and Stage 2 (identify reason for failure) investigations were undertaken at the waterbody level. However, to ensure an integrated approach to the options put forward the majority of proposed action will be to address issues at the catchment level (e.g. habitat restoration). This will be done to ensure the best way forward is taken for the environment to deliver the objectives and vision for the catchment. However, it should be noted as the overall aim for this plan is to deliver the objectives of the Thames RBMP some actions may be targeted purely at the waterbody level.



**Surface Water Management Issues identified in the Thames River Basin Management Plan**

**Point source pollution** originates from a specific point, such as a sewage treatment works (STW) discharging into a river, or the operation of a combined sewer overflow (CSO). Such pollution can introduce ammonia, phosphorus, hazardous substances or raw sewage.
An example of such an input in the Upper Thames catchment is Swindon STW, which via normal operation delivers ammonia, phosphorus and increased biological oxygen demand.

**Surface Water Management Issues identified in the Thames River Basin Management Plan**

**Diffuse pollution** refers to inputs that occur over a wide area such as fields, rather than via one defined point. Runoff from roads and urban areas can introduce oils, hydrocarbons, metals and sediments. Runoff from fields can introduce sediments, phosphorus, pesticides and organic pollution.

# 2. Addressing the problems of the catchment

## 2.1. Overall catchment priorities

There are a number of universal actions listed in the RBMP covering the whole Region which are relevant to the Upper Thames catchment. These are being implemented by a series of local actions taken to address failing elements. The tables in section 2 identify the RBMP measure code that field actions are related to as well a description and location. Together these represent a programme of works for the catchment that will deliver good ecological status as quickly as is feasible. After completion of these actions a period of further monitoring is required to enable determination of their success in improving ecological status.

## 2.2. Regional and National lead issues

Identification of significant issues has been carried out by assessment of the reasons that waterbodies are failing WFD criteria. A significant issue may

- be causing failure of the WFD target of Good Ecological Status (or potential),
- prevent achievement of Good Ecological Status or potential or
- present a risk to the current WFD status (and therefore need actions to prevent deterioration).

The scope of this plan focuses on actions that can be directly influenced or implemented at the area level. Any action that can only be, or is better off implemented at, a National or Regional level will be noted to be pursued. However, they may be driven forward by a different process outside of this plan. For the Upper Thames catchment this includes:

- Invasive non-native species
- Urban and transport development
- Phosphorus in rivers and streams
- Physical Modification

### *2.2.1. Invasive non-native species*

Invasive non-native species are plants and animals that have deliberately or accidentally been introduced outside their natural range, and by spreading quickly threaten native wildlife and can cause economic damage.

**Native white-clawed crayfish (left) and non-native American crayfish (right)**

Some species pose serious threats to our natural biodiversity and have economic impacts for example, for flood risk management, water transfer schemes, disposal of soil as waste and fisheries management. Their presence and unabated spread can represent an important pressure on the ecological status of many water bodies. Once established they are difficult or impossible to control. Examples include the plant Japanese knotweed (*Fallopia japonica*), the mammal American mink (*Neovison vison*), the fish topmouth gudgeon (*Pseudorasbora parva)* and the crustacean American signal crayfish (*Pacifastacus leniusculus*).

In this catchment there is a significant presence of American signal crayfish. These organisms have been recorded in a substantial proportion of the catchment. The American crayfish

competes for habitat and food with native invertebrate species and therefore may prevent GES. As mentioned above there are few effective control measures and therefore they represent a risk to the achievement of good ecological status in this catchment. We are developing a region-wide strategy for addressing invasive non-native species.

### *2.2.2. Urban and transport pressures*

Urban development and transport can give rise to many issues that may impact on the ecological status of the catchment. These can vary from pollution arising from urban drainage, changes to river corridors, run off from highways or transport infrastructure, to water resource issues and pollution due to pressures on the wastewater treatment infrastructure.

This is a significant issue across the Region, and in this catchment especially as large quantities of houses are proposed around Swindon (4,500 homes in the south, 10,000 to the north and 12,000 homes in the east).

The main measure to tackle pressures arising from transport infrastructure in the region is the development of a Memorandum of Understanding (MoU) between the Environment Agency and the Highways Agency. The MoU seeks to:-

- reduce and respond effectively to environmental incidents
- manage flood risk
- maintain and, where possible, improve water and air quality, and minimise the risk of land contamination
- remediate contaminated land
- improve the management of waste and encourage resource efficiency
- exchange relevant information
- promote and support health and safety on the road network
- support Government policies on sustainable development, including sustainable procurement.

Within the Upper Thames catchment at least one site has been identified as under pressure from over-abstraction; the Churn (Source to Perrots Brook). As part of an Resoring Sustainable Abstraction (RSA) scheme to combat low flows in the Churn and Ampney Brook, Thames Water licences have been reduced at Latton, Meysey Hampton and Baunton (details available in section 1.1.2). To compensate for this reduction, Thames Water constructed a pipeline from Farmoor to Swindon. Groundwater, surface water and ecological monitoring is now taking place by the Environment Agency to establish whether this scheme has mitigated against the issues experienced in the River Churn and Ampney Brook. The Vale of White Horse Chalk groundwater body is also currently poor, potentially due to abstraction.

To promote sustainable development in this catchment we will support the local authorities through the planning process to ensure that the optimum location, design and infrastructure for new development are achieved. In this catchment these actions are included in Table 2.1

**Table 2.1 Actions to address development and transport pressures**

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0192 | Working with business on planning level to promote SUDS | Kemble Ditch at Kemble, Elkstone Brook, Coln (Source to Thames), Cole (Liden Brook to Lenta Brook), Cole and Dorcan Brook (Source to Liden Brook confluence), Cole (Acorn Bridge to South Marston Brook), Cole and tributaries at Sevenhampton, Key (Source to Thames), Cole (Bower Bridge to Thames) including Coleshill | TW\EA | 2010 | 2012 | TW | Steph Ryall |
| TH0234 | We will work with the Vale of white Horse District Council to influence their emerging Core Strategy and any other relevant policy documents to require SUDS where possible in new developments. This will reduce the risk of diffuse pollution from new developments and will help to achieve the objectives of the RBMP. | Cole (Bower Bridge to Thames) including Coleshill, Cole (Acorn Bridge to South Marston Brook), Waterloo Ditch (East of Coleshill) | | | | | |
| TH0104 | Develop and implement Memorandum of Understanding (MOU) with the Highways Agency, for use during incidents and day to day work. | Thames (Waterhaybridge to Cricklade) and Chelworth Brook, Derry Brook and Leighfield Brook, Thornhill Ditch and tributaries at Cotswolds Water Park, Daglingworth Stream (Source to Churn), Thames (Source to Kemble), Cotswold Water Park Lake 12, Tuckmill Brook and tributaries, Share ditch | TW\EA | 2010 | 2012 | TW | Steph Ryall |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0234 | In the absence of specific RBMP LDF policy and for windfall sites, we will work with Swindon Borough Council and developers to influence high quality development which has the potential to protect and enhance the natural river corridor. | Liden Brook, Swindon, Cole and Dorcan Brook (Source to Liden Brook confluence), South Marston Brook to Swindon | | | | | Sarah Green |
| TH0235 | We have worked with Swindon Borough Council and the developers of Wichelstowe to ensure SUDs are featured within the development areas to sustainable manage surface water runoff to reduce flood risk and improve biodiversity. | Ray (Wiltshire) source to Lydiard Brook, South Marston Brook to Swindon, Share ditch, Cole (Bower Bridge to Thames) including Coleshill | | | | | |
| TH0192 | Working with business on planning level to promote SUDS | Kemble Ditch at Kemble | TW\EA | 2010 | 2012 | TW | Steph Ryall |
| TH0235 | We will work with Cotswold DC to develop a policy to ensure SUDs are promoted to reduce flood risk and improve biodiversity within new development. | Cerney Wick Brook (source to Thames) | | | 2010 | | Emily Dartnall |
| TH0442 | We have worked with Swindon Borough Council, their consultants and other partners on their Water Cycle Study. We will encourage the council to adopt any policy recommendations arising from this work which relate to the provision of suitable infrastructure in any relevant forthcoming DPDs or SPDs | Thames (Churn to Coln) | | | | | |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0442<br><br>TH0172 | We have supported Vale of White Horse DC preferred policy approach of ensuring infrastructure is delivered in line with development. We will continue to influence this policy development through to adoption and we will refer to this policy when responding to planning applications when adopted to positively influence future development.<br><br>Swindon Borough Council have developed a policy on Green Infrastructure which refers to multi-functional benefits such as SUDs and connection and enriching of biodiversity habitats. We will refer to this policy when responding to planning applications when adopted to positively influence future development. | Cole (Bower Bridge to Thames) including Coleshill | | | 2010 | | Emily Dartnall |
| TH0442 | We are working with Cotswold District Council as they prepare their Core Strategy, and will recommend that infrastructure is delivered in line with development. We will continue to influence this policy development through to adoption and once the plan is adopted we will refer to this policy when responding to planning applications to positively influence future development. | Thames (Churn to Coln) | | | | | |
| TH0172 | Swindon Borough Council have developed a policy on Green Infrastructure which refers to multi-functional benefits such as SUDs and connection and enriching of biodiversity habitats. We have supported Vale of White Horse DC preferred policy approach on Green Infrastructure which will enhance wildlife habitat. We will continue to influence this policy development through to adoption and will refer to policies of both Councils when responding to planning applications when adopted to positively influence future development. | Cole and tributaries at Sevenhampton | | | 2010 | | Emily Dartnall |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0103 | Swindon Borough Council have developed a policy for the Eastern Development Area which will ensure the natural environment is protected and where necessary enhanced by this development. This includes SUDs, Green Infrastrucutre, sewage treatment works if deemed necessary through the WCS. We will continue to participate and advise on the Swindon WCS. We will refer to this policy when responding to planning applications when adopted to positively influence future development. | Liden Brook, Swindon | | | 2010 | | Emily Dartnall |
| TH0172 | Policy CT3 of Swindon Borough Council's Core Strategy draft for submission (2011) supports Green Infrastructure which provides multi-functional benefits such as SUDs and connection and enriching of biodiversity habitats. Once the Plan is adopted, we will refer to this policy when responding to planning applications to positively influence future development. | Thames (Churn to Coln) | | | | | |

### *2.2.3. Phosphorus in rivers and streams*

High phosphorus concentrations are the main cause of eutrophication in fresh waters (the enrichment of waters by nutrients causing excess plant/algal growth and leading to undesirable effects on the ecology, quality and uses of the water). Activities that can be affected include water abstraction, water sports, angling, wildlife conservation and livestock watering. In standing fresh waters, blue-green algal blooms can occur; many such blooms are toxic and pose a hazard to humans involved in water sports and to animals that drink the water.

Defra has identified phosphate standards to support Good Ecological Status in fresh waters. They will be applied such that measures will be targeted to water bodies where there is evidence that nutrient levels are causing undesirable ecological impacts.

Actions to address these issues are shown in Table 2.2

**Table 2.2 Current Actions to address the issue of phosphorus in the Upper Thames catchment**

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External Partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0099 | Cross compliance farm inspection x 1 | Marston Meysey Brook, Coln (Source to Thames), Ray (Wiltshire) source to Lydiard Brook, Ray (Wiltshire): Lydiard Brook to Thames | EA | | | | Aidan Simon |
| TH0412 | Farm Inspection x 1 | Marston Meysey Brook, Thornhill Ditch and tributaries at Cotswolds Water Park, Coln (Source to Thames) | EA | | | | Aidan Simon |
| TH0021 | Inspect for compliance with water company permit to discharge including storm discharge permit. | Liden Brook, Swindon, Key (Source to Thames), Bydemill Brook (Source to Thames) | EA | | 2013 | | Andrew Valantine |
| TH0442 | We will continue to work closely with Cotswold DC to avoid a proliferation of private sewage treatment plants at Cotswold Water Park. | Cerney Wick Brook (source to Thames) | | | 2010 | | Michelle Kidd |

### *2.2.4. Physical modification*

Many lowland rivers in England and Wales have been subject to physical alteration of the river channel. These modifications include channel straightening, bank re-profiling and dredging for flood prevention, drainage or navigation purposes, as well as the creation of new channels for mill streams or irrigation. Such pressures may result in ecological habitat damage or loss that results in a decline or loss of species.

The existence of weirs, sluices and other impoundment in the river network may restrict the migration of fish, impede sediment movement, promote siltation, and disrupt the interconnectedness of accessible habitat, particularly during periods of low flow.

Although some habitat restoration work has been undertaken on a number of waterbodies in this catchment over the last ten or more years, these have been rather ad hoc opportunistic works. A priority will be to develop a restoration programme which identifies the most degraded sections of rivers and those which present the greatest opportunity for restoration, in order that proportional progress can be made, in partnership with others, to restore the ecosystem functioning of the rivers in this catchment.

Actions to address these issues are shown in Table 2.3

Above image © GBNNSS 2009

**Surface Water Management Issues identified in the Thames River Basin Management Plan**

**Invasive non-native species (INNS)** are plants and animals that have deliberately or accidentally been introduced outside their natural range, and by spreading quickly threaten native wildlife and can cause economic damage. Once established they are difficult or impossible to control.

Two examples of such issues in the Upper Thames catchment are Himalayan Balsam and the American Signal Crayfish

**Table 2.3 Actions to address the significant issue of physical modification in the Upper Thames catchment**

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected Completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0241 | Low cost habitat improvement techniques - gravel introduction, Large Woody Debris (LWD) and flow deflectors | Swill Brook (source to Ashton Keynes), Thames (Kemble to Waterhay Bridge), Cerney Wick Brook (source to Thames) | | | 2011 | | Andy Killingbeck |
| TH0141 | Fencing to protect river from poaching, erosion, sedimentation, overgrazing | Churn (Baunton to Cricklade) | EA | | 2012 | AC, Landowner | Andy Killingbeck |
| TH0033 | Rendcomb- Weir Removal, Low cost habitat improvement & Gravel | Churn (source to Perrots Brook) | EA | | 2012 | Landowner, GWT | Andy Killingbeck |
| TH0193 | Potential for fish passages for key blockages | Ampney and Poulton Brooks (Source to Thames) | EA | 2013 | | | Andy Killingbeck |
| TH0165 | Churn fluvial audit | Churn (Baunton to Cricklade), Churn (source to Perrots Brook) | EA | 2012 | 2012 | | |
| TH0033 | Physical habitat restoration in Cotswold Water Park | Swill Brook (source to Ashton Keynes) | EA | | | Cotswolds Water Park Society | Graham Scholey |
| TH0033 | Perrots Brook- Tree Pollarding to reduce overshading | Churn (source to Perrots Brook) | EA | | 2012 | Landowner | Andy Killingbeck |
| TH0033 | Northfield to Withington- Flow deflectors, Gravel & Tree Pollarding | Coln (Source to Thames) | EA | | 2013 | Landowner | Andy Killingbeck |
| TH0033 | Low cost habitat improvement techniques & gravel at North Cerney | Churn (source to Perrots Brook) | EA | | 2012 | | Andy Killingbeck |
| TH0033 | Low Cost Habitat Improvement | Churn (source to Perrots Brook) | EA | | 2012 | | Andy Killingbeck |
| TH0075 | Fish pass design for local mill | Churn (Baunton to Cricklade) | EA | | 2012 | | |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected Completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0241 | Low cost habitat improvement techniques - gravel introduction, Large Woody Debris and flow deflectors | Churn (Baunton to Cricklade) | EA | | 2012 | Landowner | Andy Killingbeck |
| TH0033 | Flow Deflectors to improve morphology and in-flow habitat | Coln (Source to Thames) | EA | | 2013 | Landowner | Andy Killingbeck |
| TH0141 | Fencing to protect river from poaching, erosion, sedimentation, overgrazing and allow recovery | Churn (Baunton to Cricklade) | | | 2012 | | Andy Killingbeck |
| TH0033 | Physical Habitat enhancements | Coln (Source to Thames) | EA | | 2012 | WTT, Landowner | |
| TH0075 | Fish Passage for key blockages | Coln (Source to Thames) | EA | | 2013 | Landowner | Andy Killingbeck |
| TH0165 | Coln fluvial audit | Coln (Source to Thames) | EA | | 2012 | | |
| TH0033 | Low cost habitat improvement techniques & Fencing to protect river from poaching, erosion, sedimentation, overgrazing | Churn (Baunton to Cricklade) | EA | | 2012 | Landowner, CWPT | Andy Killingbeck |
| TH0033 | Ampney Brook- Low cost habitat improvements | Ampney and Poulton Brooks (Source to Thames) | EA | | 2012 | Landowner, CWPT | Andy Killingbeck |
| TH0075 | Ampney Brook - improvements to fish passage | Ampney and Poulton Brooks (Source to Thames) | EA | | 2015 | | |

## 2.3. Field actions targeted for other issues

Field actions underway in this catchment in addition to those addressing the significant issues given above are listed in Table 2.4. These address local issues (pollution risk, abstraction issues, groundwater pollution) and along with the actions in Table 2.1,Table 2.2 and Table 2.3 represent the programme of activity in this catchment to deliver Good Ecological Status.

**Surface Water Management Issues identified in the Thames River Basin Management Plan**

**Low flows** can occur naturally – be it seasonally for "winterbourne" streams – or due to over-abstraction. Low flows have less of a flushing effect, resulting in longer residence times for any contaminants thus worsening their impact upon the river system. Additionally, low flows lessen the dilution of point-source inputs, leading to their concentration within the waters.
The resultant chemical characteristics and the low flows themselves can damage habitats and the life that depends upon them. An example of low flows in the Upper Thames catchment is the River Churn, which almost completely dried up for a long period in 2011.

**Surface Water Management Issues identified in the Thames River Basin Management Plan**

**Physical modification** is carried out for a number of reasons, particularly flood defence. Such modification has the potential to alter flow and damage habitats.
There are several examples of physical modification impacting upon river life in the Upper Thames.

**Table 2.4 Field actions in the Upper Thames catchment**

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0403 | Wiltshire Invasive Plants Project | Thames (Waterhaybridge to Cricklade) and Chelworth Brook, Ray (Wiltshire) source to Lydiard Brook, Ray (Wiltshire): Lydiard Brook to Thames, Derry Brook and Leighfield Brook, Swill Brook and Thames (High Bridge to Waterhay Bridge), Key (Source to Thames), Swill Brook (source to Ashton Keynes) | Wildlife Trust | 2008 | | | Graham Scholey |
| TH0124 | Visiting all fire stations for Pollution Prevention Visits | Swill Brook and Thames (High Bridge to Waterhay Bridge), Swill Brook (source to Ashton Keynes), Churn (Baunton to Cricklade), Churn (source to Perrots Brook), South Marston Brook to Swindon, Coate Water | TW\EA | 2010 | 2012 | TW | Steph Ryall |
| TH0440 | We are working with Cotswold District council to influence relevant DPDs. We will refer to evidence in the Thames RBMP to encourage the inclusion of policies requiring water efficiency in new developments. | Churn (Baunton to Cricklade), Churn (source to Perrots Brook) | | | | | |
| TH0233 | We will work with Cotswold District Council to ensure that any newsletters, fact packs or design guides that they produce as part of their LDF promote opportunities to improve the water environment | Thames (Kemble to Waterhay Bridge), Daglingworth Stream (Source to Churn) | | | | | |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0364 | We will work with the Vale of White Horse District Council to influence their emerging Core Strategy and any other relevant policy documents to include policies promoting sustainable design. We will also encourage them to include policies relating to water efficiency. This will help to achieve the objectives of the RBMP. | Cole (Acorn Bridge to South Marston Brook) | | | | | |
| TH0233 | We will work with Swindon Borough Council using the Eastern Development Area policy to influence the more detailed design guide SPD for this strategic site. | South Marston Brook to Swindon | | | 2011 | | Emily Dartnall/Jon Mansbridge |
| TH0364 | We will work with Swindon Borough Council to influence their emerging Core Strategy and any other relevant policy documents to include policies promoting sustainable design. We will also encourage them to include policies relating to water efficiency. This will help to achieve the objectives of the RBMP. | Cole (Acorn Bridge to South Marston Brook) | | | | | |
| TH0440 | We will work with Swindon borough council as they develop further DPDs to promote the need for high levels of water efficiency in new developments. We will refer to the Thames RBMP and to evidence such as CAMS and the water cycle study to encourage the inclusion of policies requiring water efficiency in new developments. | Cole (Acorn Bridge to South Marston Brook) | | | | | |
| TH0364 | We will work with Cotswold District Council to influence their emerging Core Strategy and any other relevant policy documents to include policies promoting sustainable design. We will also encourage them to include policies relating to water efficiency. This will help to achieve the objectives of the RBMP. | Churn (Baunton to Cricklade) | | | | | |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0172 | We will work with Cotswold District Council to influence their Core Strategy (currently in preparation) to include policies to support and encourage the provision of green infrastructure which incorporates benefits for the water environment, and will refer to those policies when commenting on development proposals once the plan is adopted. | Thames (Churn to Coln) | | | | | |
| TH0017 | We will work with Cotswold District Council as they prepare their Core Strategy to encourage them to develop a policy framework which maximises opportunities for enhancing biodiversity - where this can contribute to an improved water environment. We will refer to evidence in the RBMP to support this approach. Once adopted, relevant policies will apply when planning decisions are being taken, and will positively influence future development. | Thames (Churn to Coln) | | | | | |
| TH0017 | We will continue to work closely with Cotswold DC to influence the development at Cotswold Water Park to enhance biodiversity. | Cerney Wick Brook (source to Thames) | | | 2010 | | Michelle Kidd |
| TH0440 | The Vale of White Horse DC's preferred approach Core Strategy includes a commitment to use resources (including water) efficiently. We will work with the council to support this undertaking as the plan moves through to adoption. Once adopted, we will refer to this policy when commenting on planning applications. | Cole (Acorn Bridge to South Marston Brook) | | | | | |
| TH0358 | talking to and promoting the code of practise to all companies using oil filled cables in the area of work | Marston Meysey Brook | TW\EA | 2010 | 2012 | TW | Steph Ryall |

| RBMP Measure Code | What Needs to be done | Location | Lead organisation | Implementation | Expected completion | External partners | EA owner |
|---|---|---|---|---|---|---|---|
| TH0103 | Swindon Borough Council have developed a policy for the Commonhead Strategic Development Area which will ensure there is a robust buffer between the development and Coate Water Country Park. We will refer to this policy when responding to planning applications when adopted to positively influence future development. We will continue to participate and advise on the Swindon WCS. | Cole and Dorcan Brook (Source to Liden Brook confluence) | | | 2010 | | Emily Dartnall |
| TH0017 | Policy CT3 of Swindon BC's Core Strategy draft for submission (2011) requires new development to provide a net gain for biodiversity. We support this policy approach, and will refer to the policy, once adopted, when commenting on relevant development proposals | Thames (Churn to Coln) | | | | | |
| TH0234 | In the absence of specific RBMP LDF policy and for windfall sites, we will work with Swindon Borough Council, Vale of White Horse DC and developers to influence high quality development which has the potential to protect and enhance the natural river corridor. | Cole and tributaries at Sevenhampton | | | | | Sarah Green |
| TH0033 | Fish stocking especially barbel | Thames (Waterhaybridge to Cricklade) and Chelworth Brook | EA | | | | |

## 2.4. Completed Actions

The following are examples of completed actions which were designed to target specific reasons for failure in the Upper Thames catchment.

### Physical Modification

An element failure for fish has been confirmed due to morphology pressures at the River Thames (Churn to Coln). To address this following actions were put into place in order to improve the waterbody status for fish. This waterbody is now at high status for Fish.

| Work completed | Location | Lead organisation | Implementation | Completion | External partners |
|---|---|---|---|---|---|
| Creation/desilting of small backwater downstream of Cricklade | Thames (Churn to Coln) | EA | | 2009 | |
| Installation of riffles at Cricklade | Thames (Churn to Coln) | EA | 2009 | 2010 | |
| River Ray habitat restoration at Rivermead | Ray (Wiltshire) source to Lydiard Brook | Wildlife Trust | 2005 | 2008 | |
| Water Eaton enhancement (gravels and backwater) | Thames (Churn to Coln) | EA | | 2007 | |

### Point Source and Diffuse Pollution

The Ray (Lydiard Brook to Thames) has a probable element failure for phosphate. To address this two landfill sites in close proximity to Lydiard Brook were targeted for improvements in surface water discharge. These, along with future actions, are implemented in order to improve the chemical status of this waterbody.

| Work completed | Location | Lead organisation | Implementation | Completion | External partners |
|---|---|---|---|---|---|
| Peatmoor landfill improved treatment of surface water discharges and new permit to discharge 2010 | Lydiard and Shaw Brooks at Swindon | EA/Swindon Borough Council | 2010 | 2010 | Swindon Borough Council |
| Shaw Farm Landfill improvements to prevent leachate breakouts to surface water | Ray (Wiltshire) source to Lydiard Brook | EA/Swindon Borough Council | 2010 | 2010 | Swindon Borough Council |
| Talking to and promoting the code of practise to all companies using oil filled cables in the area of work | ▪ Dudgrove Brook<br>▪ Liden Brook, Swindon<br>▪ Lenta Brook, East of Swindon | TW\EA | 2010 | Q4 2010 | TW |

| Work completed | Location | Lead organisation | Implementation | Completion | External partners |
|---|---|---|---|---|---|
| Undertaking Site Waste Management Plan (SWMP) visits on all construction sites in the area. Raising awareness via on site visits, new guidance and advise and guidance to business | Thames (Coln to Leach) | TW\EA | 2010 | Q3 2010 | TW |
| Undertook Pollution Prevention at various Sites in the Swindon area. Including Elgan, Techno. | Lydiard and Shaw Brooks at Swindon | TW\EA | 2010 | Q1 2010 | TW |
| Visited all Bucks fire station and gave Pollution Prevention advice | ▪ Bydemill Brook (Source to Thames)<br>▪ Cerney Wick Brook (source to Thames) | TW\EA | 2010 | Q1 2010 | TW |
| Cross compliance farm inspection x 1 | ▪ Thames (Churn to Coln)<br>▪ Elkstone Brook<br>▪ Coln (Source to Thames) | EA | 2010 | 2010 | |
| Undertook Site Waste Management Plan (SWMP) visits in this area over the course of the year. | ▪ Waterloo Ditch (East of Coleshill)<br>▪ Thames (Churn to Coln)<br>▪ Thames (Kemble to Waterhay Bridge)<br>▪ Ray (Wiltshire) source to Lydiard Brook<br>▪ Ray (Wiltshire): Lydiard Brook to Thames | TW\EA | 2010 | Q1 - Q4 2010 | TW |

## Miscellaneous Field Actions

| Work completed | Location | Lead organisation | Implementation | Completion | External partners |
|---|---|---|---|---|---|
| Fish stocking especially barbel | Thames (Waterhaybridge to Cricklade) and Chelworth Brook, Thames (Churn to Coln) | EA | 2007 | 2009 | |
| Fresh stone/gravel and fencing | Cole (Bower Bridge to Thames) including Coleshill | | | 2007 | |
| Low cost habitat improvement techniques - gravel introduction, Large Woody Debris and flow deflectors | ▪ Cerney Wick Brook (source to Thames)<br>▪ Thames (Kemble to Waterhay Bridge) | EA | | 2011 | CWP soc |
| North Cerney - fencing to prevent poaching and allow recovery of banks and vegetation | Churn (source to Perrots Brook) | EA | | 2011 | AC, GWT, Landowner |
| WFD Ock Project investigation | Liden Brook, Swindon | EA | 2010 | 2010 | |

# Case Study: Physical in-stream habitat improvements on the River Coln

## Issue

The River Coln is failing its WFD targets. Its is failing because of the poor instream plant communities and the lower than expected fish populations.

These issues are particularly evident on the lower Coln, from Fairford to the confluence with the Thames at Roundhouse. The instream plant community is extremely limited and it is assumed that this has a knock on, negative impact on fish populations due to the loss of habitat these plants provide. It is also clear that the gravel substrate on much of the reach is poor which means that recruitment of gravel spawning species, both salmonids and coarse fish, is poor.

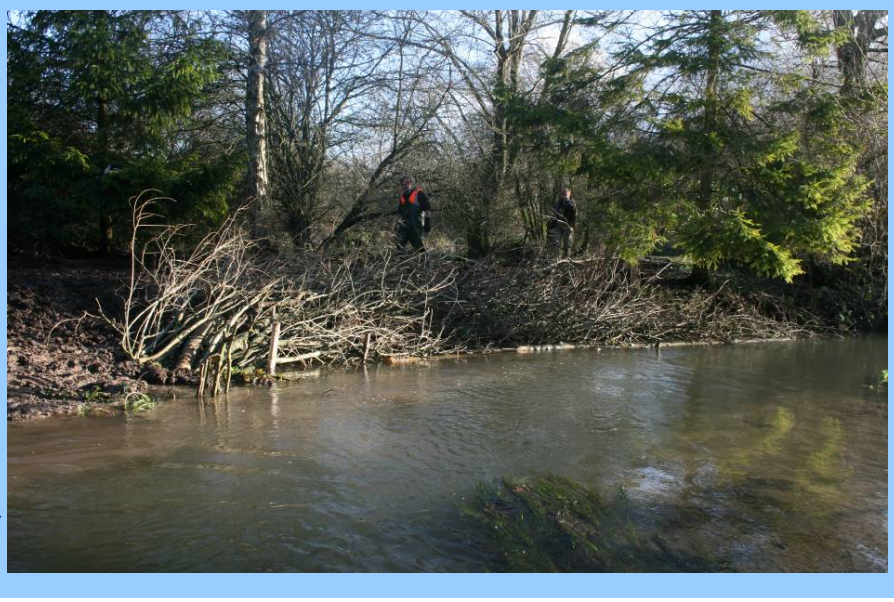
## Work Done

We have been working in partnership on the lower reach of the Coln to implement some very cost effective measures to improve instream physical habitat both to encourage plant growth, and improve the gravels that many of the fish and plants rely upon.

A good example of this was the work we did upstream of Whelford in partnership with the landowner, the Wild Trout Trust, and Thames Water.

## Result

With moderate financial inputs from Thames Water, the landowner and the EA, the Wild Trout Trust carried out the works using their experienced and practical staff. They used a range of techniques over the 1 km stretch - installing pieces of large woody debris to encourage the scouring and cleaning of the gravel bed and to provide cover and instream habitat diversity; re-profiling banks to improve habitat, narrow the river and reduce siltation: and using brush wood on the margins to provide cover particularly for juvenile fish.



# 3. Catchment management programme

## 3.1. Predictions for the Upper Thames catchment

In order to enable progress monitoring towards good ecological status we have predicted, based upon the programme of investigations and actions, when each of the waterbodies may reach good ecological status.

Part of this activity involved the reclassification of waterbodies using the very latest data available. This reclassification has lead to a number of changes in the waterbody classifications and predictions for future status.

The table below represents our best view of the status of the waterbodies in the future assuming that the programme of investigations and actions goes ahead as planned. It may be that we will not have appropriate monitoring in place to provide evidence of a change in status for every individual waterbody, but it is reasonable to forecast expected status as a result of completed actions.

Our view of progress towards GES are shown in the table below.

**Table 3.1 Predictions for Good Ecological Status for the Upper Thames catchment**

| WB ID | Waterbody name | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2021 | 2027 |
|---|---|---|---|---|---|---|---|---|---|---|
| 22860 | Liden Brook, Swindon | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 22870 | Lenta Brook, East of Swindon | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 22880 | Cole (Liden Brook to Lenta Brook) | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 29990 | Coln (Source to Thames) | Poor | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 22890 | Cole and Dorcan Brook (Source to Liden Brook confluence) | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 22900 | Cole (Acorn Bridge to South Marston Brook) | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 22910 | South Marston Brook to Swindon | Moderate | Good | Good | Good | Good | Good | Good | Good | Good |
| 22920 | Tuckmill Brook and tributaries | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 22930 | Cole and tributaries at Sevenhampton | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 22950 | Waterloo Ditch (East of Coleshill) | Poor | Good | Good | Good | Good | Good | Good | Good | Good |
| 22960 | Thames (Waterhaybridge to Cricklade) and Chelworth Brook | Moderate | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 22990 | Thames (Churn to Coln) | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 23110 | Dudgrove Brook | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 23240 | Thames (Coln to Leach) | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 23310 | Lydiard and Shaw Brooks at Swindon | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 23320 | Ray (Wiltshire) source to Lydiard Brook | Good | Moderate | Moderate | Moderate | Moderate | Good | Good | Good | Good |
| 23330 | Ray (Wiltshire): Lydiard Brook to Thames | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |

| 23620 | Derry Brook and Leighfield Brook | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
|---|---|---|---|---|---|---|---|---|---|---|
| **WB ID** | **Waterbody name** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2021** | **2027** |
| 23640 | Swill Brook and Thames (High Bridge to Waterhay Bridge) | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 23650 | Key (Source to Thames) | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 23680 | Share ditch | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 23700 | Swill Brook (source to Ashton Keynes) | Moderate | Poor | Poor | Poor | Poor | Poor | Good | Good | Good |
| 23710 | Bydemill Brook (Source to Thames) | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Good |
| 23730 | Cole (Bower Bridge to Thames) including Coleshill | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 23760 | Thames (Kemble to Waterhay Bridge) | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 23800 | Cerney Wick Brook (source to Thames) | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 23810 | Kemble Ditch at Kemble | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 23860 | Marston Meysey Brook | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 29750 | Churn (Baunton to Cricklade) | Bad | Poor | Good | Good | Good | Good | Good | Good | Good |
| 29760 | Thornhill Ditch and tributaries at Cotswolds Water Park | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 29770 | Daglingworth Stream (Source to Churn) | Bad | Bad | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 29790 | Elkstone Brook | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 29810 | Churn (source to Perrots Brook) | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Poor | Good |
| 29990 | Coln (Source to Thames) | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 30170 | Thames (Source to Kemble) | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 30300 | Ampney and Poulton Brooks (Source to Thames) | Bad | Good | Good | Good | Good | Good | Good | Good | Good |
| 1GB600400 | Burford Jurassic | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Good |
| 2GB600500 | Kemble Forest Marble | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| 2G600600 | Shrivenham Corallian | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Good |
| 1G601000 | Vale of White Horse chalk | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Good |
| 3GB000200 | Upper Thames Gravels | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Bad | Good |

Please note this is a prediction at this stage of the catchment plan process and is for guidance only. Classification predictions will change as new or aspirational measures are confirmed for delivery.

## 3.2. Who's in the catchment?

Outlined below are the various agencies, organisations and individuals, known otherwise as "delivery group members", currently present in the Upper Thames catchment. This list is not definitive, as these and other stakeholders will be approached with the publication of this catchment management plan.

- Environment Agency: identified as the competent authority.
- Farming and Wildlife Advisory Group (FWAG) – South West (SW): Catchment host

Other Stakeholders

- British Waterways: responsible for inland waterways in the UK. The major waterway in the Upper Thames catchment is the Thames and Severn canal.
- Cotswolds AONB: an organisation that exists to conserve and enhance the Cotswolds Area of Outstanding Natural Beauty (AONB).
- Cotswold District Council, Swindon Borough Council, Wiltshire Council and Vale of White Horse District Council are the local authorities for the area.
- Cotswolds Rivers Trust: a not for profit organisation set up to help implement physical improvements to the Cotswolds rivers and to campaign for improvements.
- Cotswolds Water Park Trust: an environmental charity working to improve all 40 square miles of the Cotswold Water Park for people and wildlife.
- Gloucestershire Wildlife Trust: local charities in the Gloucestershire area with the specific aim of protecting the United Kingdom's natural heritage.
- Natural England: Government advisor on the natural environment.
- National Farmers Union: the largest farming organisation in the UK
- Upper Thames Fisheries Consultative: Represents angling clubs and interests through consultation with the Environment Agency.
- Wiltshire Wildlife Trust - local charities in the Wiltshire area with the specific aim of protecting the United Kingdom's natural heritage.

The delivery group is being hosted by the Farming and Wildlife Advisory Group (FWAG) – South West (SW). Within Gloucestershire, FWAG have been developing an integrated local delivery (ILD) model, implemented in a range of situations that utilises and enables those with local skills and environmental land management knowledge to contribute to the management of sensitive and key environmental sites.

A list of externally stakeholder plans which are relevant to the Water Framework Directive is available in Appendix 6

# Appendices

## Appendix 1: Acronyms

| | |
|---|---|
| AMP(5 or 6) | Water company Asset Management Plan (2010 to 2014 for AMP5, or 2015 to 2019 for AMP6) |
| AONB | Area of outstanding natural beauty |
| ARK | Action for the River Kennet |
| BH | Borehole |
| BW | British Waterways |
| CAMS | Catchment Abstraction Management Strategy |
| CEH | Centre for Hydrology and Ecology |
| CSF | Catchment Sensitive Farming |
| CSO | Combined Sewer Overflow |
| DC | District Council |
| Defra | Department for Environment, Food and Rural Affairs |
| DO | Dissolved Oxygen |
| DPD | Development Plan Document |
| DrWPA | Drinking Water Protected Area |
| EA | Environment Agency |
| EM | Environmental Management |
| EO | Environment Officer |
| GES | Good Ecological Status |
| GEP | Good Ecological Potential |
| GWDTE | Groundwater Dependent Terrestrial Ecosystem |
| GWHCL | Groundwater Hydrology and Contaiminated land |
| GWQual | Groundwater Quality |
| HMWB | Heavily modified water body |
| HOP | Hatches Operating Protocol |
| INNS | Invasive Non-Native Species |
| K&A | Kennet & Avon canal |
| KCRP | Kennet chalkstream restoration project |
| LA | Local Authority |
| LWD | Large Woody Debris |
| Ml/d | Megalitres (million litres) per day |
| MoU | Memorandum of Understanding |
| NE | Natural England |
| NH4 | Ammonium |

| | |
|---|---|
| NVZ | Nitrate Vunerable Zone |
| PP | Pollution Prevention |
| PPC | Pollution Prevention Control |
| PWS | Public Water Supply |
| (f)RBMP | (first) River Basin Management Plan (Published in 2009) |
| RFF | Reason for failure |
| RSPB | Royal Society for the Protection of Birds |
| RSA | Restoring Sustainable Abstraction |
| SGZ | Surface Water Safeguard Zones |
| SPZ | Source Protection Zone |
| SSSI | Site of special scientific interest |
| STW | Sewage Treatment Works |
| SUDs | Sustainable Urban Drainage Systems |
| SWMP | Site Waste Management Plan |
| TBT | Tributylin |
| TW | Thames Water |
| WBID | Waterbody ID |
| WFD | Water Framework Directive |
| WLMP | Water level management plan |
| WRGIS | Water Resources Geographic Information Systems |
| µg/l | Micro-grams per litre – millionths of a gram per litre |

## Appendix 2: Glossary

**Artificial Water Bodies** are surface water bodies which have been created in a location where no water body existed before and which have not been created by the direct physical alteration, movement or realignment of an existing water body.

**Biochemical Oxygen Demand** is the amount of dissolved oxygen consumed by chemical and microbiological action when a sample effluent is incubated for 5 days at 20$^{o}$C. This test is used to show the presence of sewage in water.

**Catchment** is the area from which precipitation contributes to the flow from a borehole spring, river or lake. For rivers and lakes this includes tributaries and the areas they drain.

**Catchment Sensitive Farming** is an initiative aimed at promoting water-friendly farming to help tackle agricultural pollution.

**Chemical Status** is the classification status for the water body against the environmental standards for chemicals that are priority substances and priority hazardous substances. Chemical status is recorded as good or fail. The chemical status classification for the water body, and the confidence in this (high or low), is determined by the worst test result.

**Classification** is the methods for distinguishing the environmental condition or “status” of water bodies and putting them into one category or another.

**Diatom**, a mobile plant of microscopic single cell or colonial algae – a type of phytobenthos

**Diffuse Sources of Pollution** are generally associated with surface water run-off and different land uses such as agriculture and forestry. Pollution also originates from septic tanks associated with rural dwellings and from the land with the spreading of industrial, municipal and agricultural wastes.

**Dissolved Oxygen** is the concentration of oxygen dissolved in water. This is expressed in mg/l or as a percent saturation where saturation is the maximum amount of oxygen that can be dissolved in water at a given altitude or temperature.

**Ecological Status** applies to surface water bodies and is based on the following quality elements: biological quality, general chemical and physico-chemical quality, water quality with respect to specific pollutants (synthetic and non synthetic), and hydromorphological quality. There are five classes of ecological status (high, good, moderate, poor or bad). Ecological status and chemical status together define the overall surface water status of a water.

**Ecological Potential** is status of a heavily modified or artificial water body measured against the maximum ecological quality it could achieve given the constraints imposed upon it by those heavily modified or artificial characteristics necessary for its use. There are five ecological potential classes for Heavily Modified Water Bodies/Artificial Water Bodies (maximum, good, moderate, poor and bad).

**Environment Agency Water Body Identifier** All Water Bodies throughout England and Wales have been given a unique twelve digit code. This code allows for the quick and precise identification of any given Water Body.
An example of this in Thames West Area would be the code: GB106039042650 which gives reference to the Upper Upper Thames at Byfield.

**Eutrophication** is the enrichment of waters by inorganic plant nutrients that results in increased production of algae and/or other aquatic plants, which can affect the quality of the water and disturb the balance of organisms present within it.
**Good Chemical Status** means that concentrations of pollutants (priority substances and priority hazardous substances) in the water body do not exceed the environmental limit values specified in the Water Framework Directive Article 16 daughter Directive.

**Good Ecological Potential** Those surface waters which are identified as Heavily Modified Water Bodies and Artificial Water Bodies must achieve 'good ecological potential' (good potential is a recognition that changes to morphology may make good ecological status very difficult to meet). In the first cycle of river basin planning good potential may be defined in relation to the mitigation measures required to achieve it.

**Good Ecological Status** The objective for a surface water body to have biological, structural and chemical characteristics similar to those expected under nearly undisturbed conditions.

**Good Status** is a term meaning the status achieved by a surface water body when both the ecological status and its chemical status are at least good or, for groundwater, when both its quantitative status and chemical status are at least good and show no signs of deterioration

**Groundwater** refers to water occurring below ground in natural formations (typically rocks, gravels and sands).

**Heavily Modified Water Bodies** are surface water bodies whose nature has changed fundamentally as a result of physical alterations due to human activities.

**Macro-invertebrates**, Invertebrates (without a backbone) which are visible to the naked eye, eg river flies

**Macrophytes** are larger plants, typically including flowering plants, mosses and larger algae but not including single-celled phytoplankton or diatoms.

**Measure** is the term used in the Water Framework Directive and domestic legislation. It means an action which will be taken on the ground to help achieve Water Framework Directive objectives.

**Perennial,** a stream or river which flows all year round

**Perennial head,** the point at which a winterbourne becomes a perennial river

**Phytobenthos** are bottom-dwelling multi-cellular and unicellular aquatic plants such as some species of diatom.

**Point Sources of Pollution** are primarily discharges from municipal wastewater treatment plants associated with dense areas of population or effluent discharges from industry.

**Q95 flow,** the flow rate that is exceeded for 95% of the time, typically a low summer flow

**Quantitative Status for Groundwater** is an expression of the degree to which a body of groundwater is affected by direct and indirect abstractions. If this complies with Directive requirements the status is good.

**River Basin** is the area of land from which all surface water run-off flows, through a sequence of streams, rivers and lakes into the sea at a single river mouth, estuary or delta.

**River Basin Characterisation** is the first stage in the Water Framework Directive management cycle. It describes the water environment and the human pressures upon it, so that the risk of failing to meet the Water Framework Directive's targets or objectives can be assessed.

**River Basin Management Plan(s)** set out in general terms how the water environment will be managed. They also provide a framework for more detailed decisions to be made.

**Surface Water** is a general term used to describe all the water features such as rivers, streams, springs, ponds and lakes.

**Water Body** is a discrete and significant element of surface water such as a river, lake, reservoir or a distinct volume of groundwater within an aquifer.

**The Water Framework Directive**, introduced in December 2000, is the most substantial piece of water legislation from the EC to date. It promotes a new approach to water management through river basin planning, helping the Environment Agency to improve and protect inland and coastal waters and create better habitats for wildlife that lives in and around water.

**Winterbourne,** a stream or river which is dry during the summer months

# /Appendix 3: Catchment Schematics

# Waterbody map and Reasons for failure schematic of the Upper Thames catchment

Draft Catchment Plan

Last Updated 06/12/2011

**23810 Kemble Ditch at Kemble**
At GES

**30170: Thames (Source to Kemble)**
At GES

**Medium Priority**
**23760 Thames (Kemble to Waterhay Bridge)**
**Fish:**
Unknown certainty and cause
**Hydrology:**
Suspect data confirmed.

**Medium Priority**
**29770 Daglingworth Stream (Source to Churn)**
**Fish:**
Unknown certainty and cause
**Hydrology:**
Suspect data confirmed.

**29790 Elkstone Brook**
At GES

**Medium Priority**
**29810 Churn (source to Perrots Brook)**
**Fish:**
Probably due to physical modification and also suspected to be due to groundwater abstraction
**Hydrology:**
Suspected to be due to groundwater abstraction
**Macrophytes and Phytobenthos:**
Unknown certainty and cause.

**23110 Dudgrove Brook**
At GES

**Medium Priority**
**29990 Coln (Source to Thames)**
**Fish:**
Failure due to physical modification probable.

**23860 Marston Meysey Brook**
At GES

**29760 Thornhill Ditch and tributaries at Cotswolds Water Park**
At GES

**High Priority**
**23800 Cerney Wick Brook (source to Thames):**
**Fish:**
Confirmed physical modification (probably land drainage) effecting morphology. See below for Phosphate causes.
**Phosphate:**
Probable public STW

**High Priority**
**29750 Churn (Baunton to Cricklade)**
**Hydrology:**
Groundwater abstraction a suspected cause of failure
**Fish:**
Failure suspected to arise from hydrology due to groundwater abstraction, and morphology due to physical modification.

**Top Priority**
**30300 Ampney and Poulton Brooks (Source to Thames)**
**Fish:**
Probable failing due to drying up of watercourse and barriers to fish migration. Predicted GES by 2015

**23240 Thames (Coln to Leach)**
**Mitigation Measures assessment:**
Physical modification for inland navigation confirmed as a cause of failure

Downstream: Windrush & Leach Catchment Plan

**Top Priority**
**23700 Swill Brook (source to Ashton Keynes)**
**Fish:**
Predicted GES by 2015

**23640 Swill Brook and Thames (High Bridge to Waterhay Bridge)**
At GES

**23620 Derry Brook and Leighfield Brook**
**Invertebrates:**
Morphology probably due to land drainage.
A diffuse source is suspected as causing dissolved oxygen and Ammonia levels.

**Very High Priority**
**22960 Thames (Waterhaybridge to Cricklade) and Chelworth Brook**
**Fish:**
Morphological 'pressure' confirmed as Land Drainage.

**Very High Priority**
**22990 Thames (Churn to Coln)**
**Phosphate & Plants:**
Probably due to continuous water company sewage discharge, though an agricultural/rural management diffuse source is also suspected. Phosphate is Confirmed as less than good status.
**Fish:**
Confirmed morphology suspect data

**Very High Priority**
**23730 Cole (Bower Bridge to Thames) including Coleshill**
**Phosphate:**
Probable failure due to industrial discharge, with a diffuse agricultural source also suspected.
**Phytobenthos:**
Probable failure due to industrial discharge, with a diffuse agricultural source also suspected, both applying pressures via phosphates

**High Priority**
**23650 Key (Source to Thames)**
**Phosphate:**
Probably due to continuous water company sewage discharge, though an agricultural/rural management diffuse source is also suspected.
**Ammonia (Phys-Chem/Annex 8):**
Probably the result of TW continuous sewage discharge.

**22930 Cole and tributaries at Sevenhampton**
**Phosphate:**
Probably from a TW sewage discharge and also potentially from a suspected unknown diffuse source.

**22920 Tuckmill Brook and Tributaries**
**Phosphates:**
Failure probably due to water company sewage discharge

**Very High Priority**
**22950 Waterloo Ditch (East of Coleshill)**
**Invertebrates:**
Confirmed to be failing due to natural low flows and morphology

**23330 Ray (Wiltshire): Lydiard Brook to Thames**
**Phosphate:**
Probably from a TW sewage discharge and also potentially from a suspected unknown diffuse source.

**Medium Priority**
**23680 Shard Ditch**
**Phosphate & Plants:**
Probably from a TW sewage discharge and also potentially from a suspected unknown diffuse source.
Phosphate is confirmed as being at a less than good status

**23710 Bydemill Brook (Source to Thames)**
**Invertebrates:**
Sediment is suspected of resulting from an unknown diffuse agricultural/rural management source and the cause of the morphology is unknown See below for causes of ammonia 'pressure'.
**Phosphate and Ammonia:**
Probably the result of a continuous TW sewage discharge

**High Priority**
**22910 South Marston Brook to Swindon**
**Invertebrates:**
Unknown suspect data

**High Priority**
**22900 Cole (Acorn Bridge to South Marston Brook**
**Invertebrates:**
Physical modification (land drainage) is probably the cause of the morphology. Suspected natural low flows are causing the hydrology
**Phosphate:**
Suspected as a result of public continuous TW sewage discharge and an unknown diffuse agricultural/rural management source.

**22890 Cole and Dorcan Brook (Source to Liden Brook confluence)**
At GES

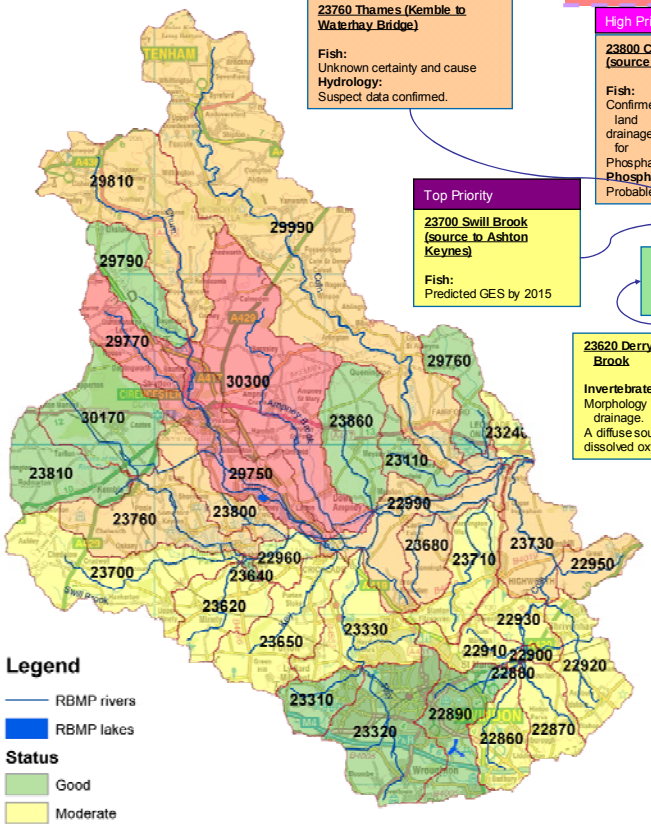
**22880 Cole (Liden Brook to Lenta Brook):**
**Phosphate:**
Probably from a TW sewage discharge and
Also potentially from a suspected unknown diffuse source.

**22870 Lenta Brook, East of Swindon**
**Plants:**
Unknown certainty or cause

**23310: Lydiard and Shaw Brooks at Swindon:**
At GES

**23320: Ray (Wiltshire) source to Lydiard Brook:** GES

**22860 Liden Brook, Swindon**
**Phosphate:**
Probably from a TW sewage discharge and also potentially from a suspected unknown diffuse source.




A thick purple dashed line indicates that the WB is associated with a GW failure as well.

# Waterbody map and Action plan schematic of the Upper Thames catchment

Draft Catchment Plan

I) Investigations in progress (unless specified)
- Stage 1 - investigate to confirm failure and/or impact
- Stage 2 - Investigate cause of failure
- Stage 3 - Investigate feasible measures

CA) Current Actions
RA) Recommended Actions

23810: Kemble Ditch at Kemble: GES
No investigations or actions

30170: Thames (Source to Kemble): GES
No investigations or actions

**Top Priority**
**23700: Swill Brook (source to Ashton Keynes): fish**
I) Fish stage 2 planned, Hydrology stage 2
CA) Physical habitat restoration in Cotswold Water Park,
Low cost habitat improvement techniques - gravel introduction, LWD and flow deflectors
RA) none at present

**Medium Priority**
**23760: Thames (Kemble to Waterhay Bridge): fish**
I) Fish stage 1&2
CA) Low cost habitat improvement techniques - gravel introduction, LWD and flow deflectors
RA) none at present

**High Priority**
**23800: Cerney Wick Brook (source to Thames): fish**
I) P stage 1&2, Fish stage 3?
CA) Low cost habitat improvement techniques - gravel introduction, LWD and flow deflectors.
RA) Actions dependant on survey to see if improvements worked for fish. Audit visit to Cirencester STW

**Medium Priority**
**29810: Churn (source to Perrots Brook): Phytobenthos, fish**
II) Fish stage 2, Hydrology stage 2 planned, Plants stage 2
CA) None
RA) Habitat restoration

**Top Priority**
**30300: Ampney and Poulton Brooks (Source to Thames): Fish, Hydrology**
I) Hydrology stage 3 planned, Fish stage 3?
CA) potential for fish passage???
RA) depending on outcome of investigations

**23860: Marston Meysey Brook: GES**
**No investigations**
**CA)** Target high risk farms and undertake regulatory farm visits using, pollution prevention notices and advisory letters where necessary
Progress delivery of Cross-compliance inspection and enforcement
Enforcement of Groundwater Regulations to control agri-chemicals through Cross Compliance
Enforcement of Sludge Regulations through Cross compliance

**29790: Elkstone Brook: GES**
No investigations
**CA)** Target high risk farms and undertake regulatory farm visits using, pollution prevention notices and advisory letters where necessary (farm visit x 1)
**RA)** None at present

**Medium Priority**
**29770: Daglingworth Stream (Source to Churn): fish**
I) Fish stage 2
CA) none
RA) not known at this time. Solve issues in d/s WB

**High Priority**
**29750: Churn (Baunton to Cricklade): fish**
I) Fish stage 1&2, Hydrology stage 2?, Inverts stage 3?
CA) Bring private STW back into compliance
RA) Habitat restoration

**23620: Derry Brook and Leighfield Brook: Invertebrates**
I) Invertebrates stage 2
CA) none
RA) Farm visits (suspect diffuse pollution an issue). Habitat restoration required and diffuse WQ issues need sources (habitat review report see bio)

**23640: Swill Brook and Thames (High Bridge to Waterhay Bridge): GES**
no investigations or actions

**23110: Dudgrove Brook: GES**
I) none
CA) none at present

**Medium Priority**
**29990: Coln (Source to Thames): fish**
I) Fish stage 2, Plants stage 1
CA) target high risk farms (cross compliance & regulatory visits) x 5
RA) none at present

**29760: Thornhill Ditch and tributaries at Cotswolds Water Park - GES**
**I)** No investigations
CA) Target high risk farms and undertake regulatory farm visits using, pollution prevention notices and advisory letters where necessary x 3

**High Priority**
**23650: Key (Source to Thames): Phosphate, ammonia**
I) P stage 1&2, Ammonia stage 3?, Sediment completed - GES
CA) no further actions
RA) Purton STW compliance check (EM) - medium priority. Targeting of high risk farms. Habitat restoration required for fish

**Very High Priority**
**22960: Thames (Waterhaybridge to Cricklade) and Chelworth Brook: fish**
I) Fish stage 1& 2
CA) none at present
RA) More habitat work possibilities (backwater needs digging out again). survey to see if improvements worked for fish.

**Very High Priority**
**22990: Thames (Churn to Coln): Phytobenthos**
I) P stage 2, Fish stage 1&2, Plants stage 2
CA) Installation of riffles at Cricklade. Water Eaton enhancement (gravels and backwater).
Creation/desilting of small backwater downstream of Cricklade.
Stocking of barbel to create a "viable" population
Target high risk farms and undertake regulatory farm ( visit x 1)
RA) visit STW for compliance checks

Downstream: Windrush & Leach Catchment Plan

**23240: Thames (Coln to Leach): Mitigation measures assessment**
I) Mitigation assessment stage 3
CA) none at present

**23330: Ray (Wiltshire): Lydiard Brook to Thames: Phosphate**
I) Phosphate stage 1& 2
CA) Cross compliance farms inspections x 3 - for GW regs, sludge regs etc.
RA) carry out compliance visit to STW. EA gauging weir needs looking into for fish passage. Open up flood plain nr landfill site (PPC team?)

**Medium Priority**
**26380: Share ditch: Phytobenthos**
I) Phosphate stage 2, Plants stage 3?, sediments completed GES
CA) none
RA) Low prority compliance visit to Blunsden STW and target high risk farms for visits.

**23710: Bydemill Brook (Source to Thames): Ammonia (Annex 8), Phosphate, Ammonia (Phys-Chem), Invertebrates**
I) P stage 1&2, Ammonia stage 2, Inverts stage 2, sediment stage 3?
CA) none
RA) compliance visit to TW STW & visits to high risk farms. Possible farm visit required nr survey site. Audit visit to Highworth STW. Habitat improvements possibly.

**Very High Priority**
**23730: Cole (Bower Bridge to Thames) including Coleshill: Phytobenthos**
Inv) P stage , Fish stage 1, Plants stage 3?
CA) fresh stone/gravel and fencing??? Fisheries -completed
RA) compliance visit to STW and target high risk farms for visits.

**23310: Lydiard and Shaw Brooks at Swindon: GES**
I none
CA) compliance with discharge consent - Peatmoor landfill improved treatment of surface water discharges and new permit to discharge 2010???
RA) none

**23320: Ray (Wiltshire) source to Lydiard Brook: GES**
I) Phosphate stage 1&2
CA) River Ray habitat restoration at Rivermead
Cross compliance farm visits x 3
Shaw Farm Landfill improvements to prevent leachate breakouts to surface water
RA) none

**22930: Cole and tributaries at Sevenhampton: Phosphate**
I) Phosphate stage 2
CA) None

**Very High Priority**
**22950: Waterloo Ditch (East of Coleshill): Invertebrates**
I) Invertebrates stage 2
CA) GW investigation ongoing
RA) none at present

**22920: Tuckmill Brook and tributaries: Phosphate**
I) Phosphate stage 1
CA) none
RA) Low priority visit - Shriverham Works STW.

**High Priority**
**22910: South Marston Brook to Swindon: Invertebrates**
I) Inverts stage 3?
CA) none at present

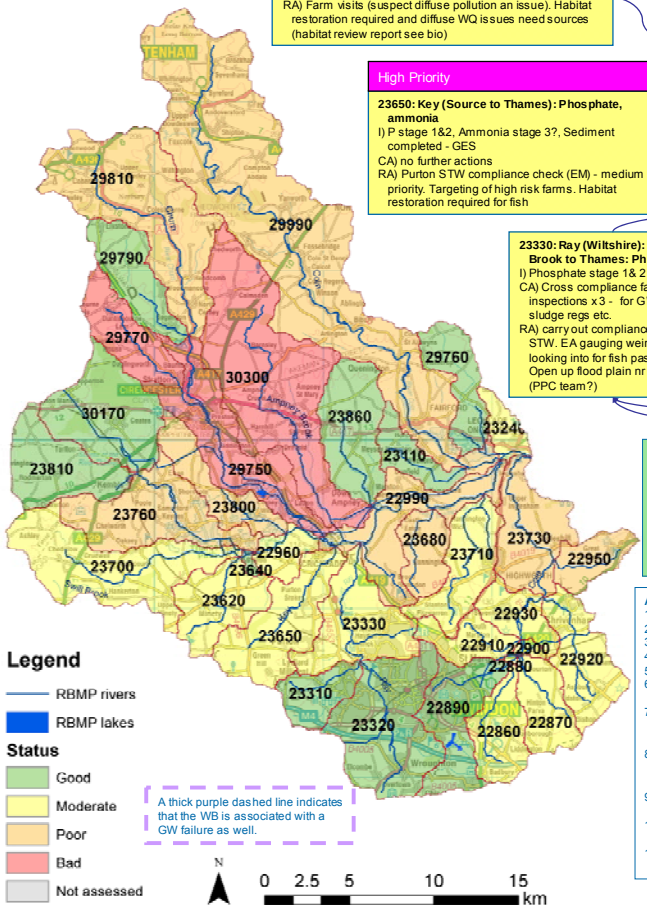
**High Priority**
**22900: Cole (Acorn Bridge to South Marston Brook): Phosphate, Invertebrates**
I) P stage 1&2, Inverts stage 3?
CA) none
RA) Not known at this time compliance visit to STW, targeting high risk farms. Habitat improvements. Compliance visit to private works

**22870: Lenta Brook, East of Swindon: Phytobenthos**
I) Phosphate stage 1, Plants stage 2
CA) none
RA) none at present

**22880: Cole (Liden Brook to Lenta Brook): Phosphate**
I) Phosphate investigation ongoing
CA) none
RA) Not known at this time compliance visit to STW, targeting high risk farms

**22890: Cole and Dorcan Brook (Source to Liden Brook confluence): GES**
I) no investigations
CA) none
RA) none

**22860: Liden Brook, Swindon: Phosphate**
I) Phosphate stage 1 & 2
CA) Target high risk farms and undertake regulatory farm visits using, pollution prevention notices and advisory letters where necessary -WFD Ock Project investigation
RA) compliance visit to STW. STW audit -EM. Pollution prevention targetting hazardous waste. Workshops for catering co's, working with TW (flag fo PL).. Highways Agency work




A thick purple dashed line indicates that the WB is associated with a GW failure as well.

**Actions for all upper Thames WBs:**
1. Promote the use of SUDs, influence businesses at a planning level
2. PP advice to fire stations and establish MoU for use in incidents
3. Develop and implement MOU with Highways, for use during incidents and day to day work.
4. Promote good practice to avoid pollution from construction sites. Carry out SWMP visits
5. Implementation of 'oil-filled cables' operating agreement with electricity transmission companies
6. Ensure that planning policies and spatial planning documents take into account the objectives of the RBMP.
7. Influence the planning and development sector to ensure that the objectives of the WFD and RBMP are considered in relevant strategic plans and planning applications & that this is reflected in any related environmental assessments.
8. Influence Swindon Council using the Eastern Development area policy to influence the more detailed design guide SPD for this strategic site (& opportunities to improve the water environment are maximised).
9. We will continue to work closely with Cotswold DC to avoid a proliferation of private sewage treatment plants at Cotswold Water Park.
10. We will continue to work closely with Cotswold DC to influence the development at Cotswold Water Park to enhance biodiversity.
11. Support established local fora by providing advice and guidance and support control actions - through Wiltshire invasive plants project

## Appendix 4: Description of Water Framework Directive Classifications and Elements

The WFD classification system has been established by UKTAG, the government advisory group for the WFD. The overall status of a waterbody is comprised of Ecological status and Chemical status. The Ecological status is made up of two subsets of elements; Physico-chemical elements and Biological elements. The chemical status of a waterbody is determined by compliance with priority substances.

### Biological Elements (Ecological Status)

The biological elements were chosen because they respond to the pressures identified in the risk assessments carried out under Article V of the Water Framework Directive.

**Phytobenthos** are bottom-dwelling multi-cellular and unicellular aquatic plants such as some species of diatom.

- Phytobenthos are indicators of nutrient enrichment and, and can be used to assess river water quality. Unlike the other elements we monitor they are relatively unimpacted by other pressures. This makes them a very useful tool for targeting monitoring approaches.

**Macrophytes** are larger plants, typically including flowering plants, mosses and larger algae but not including single-celled phytoplankton or diatoms.

- Macrophytes are an indicator of the impact of increased nutrients in rivers and can be influenced by other pressures such as channel engineering, water abstraction, flow impoundment or acidification.

**Invertebrates** are aquatic animals without backbones that dwell on or in the bottom sediments of rivers. This includes insects (e.g *Phryganeidae and Heptageniidae*), worms (e.g *Oligochaetes*), molluscs (e.g *Lymnaeidae*), and crustacea.)

- Invertebrate communities are used to assess water quality, as they are good indicators of organic enrichment. They are primarily used as indicators of water quality, but can also be used to indicate reduced flows, sedimentation pressure and habitat damage. Invertebrates are particularly useful at providing information about environmental pressures in a specific area of the river as they are less mobile than fish and are therefore more vulnerable to local changes in water quality, flow or habitat.

**Fish** (including eel)

- Primarily sensitive to abstraction of water and morphological alterations. Fish are also sensitive to factors such as organic pollution (e.g. ammonia) and low concentrations of dissolved oxygen.

### Physico-chemical Elements (Ecological Status)

Physico-chemical factors include pH, dissolved oxygen, ammonia and phosphates and temperature. All of which are required to support a functioning ecosystem. For example, fish cannot survive and reproduce unless there is sufficient dissolved oxygen and suitable habitat.

**Ammonia** is a compound of nitrogen and hydrogen. Unionised ammonia is hazardous due to its toxic and sub-lethal impacts on fish and macroinvertebrates. Such as repression of the immune system and gill damage. The toxicity of unionised ammonia increases as pH and temperature increase, however ionised ammonia decreases.

**Dissolved Oxygen (DO)** is essential for the survival of organic organisms as both plants and animals use it. Low levels of DO are a sign of an unhealthy river. DO varies daily, seasonally and through the water column.

**pH** is monitored for the protection of ecology, and should be between 6-9 in a healthy river system. Small changes in pH can have a large impact on water chemistry and ecology.

**Phosphates (P)** in our river comes from a number of sources including treated sewage effluent and agriculture. Phosphates are essential for plant growth but at higher levels can lead to eutrophication and a change to the river's ecology.

**Annex 8 Chemicals** are specific pollutants, such as zinc, cypermethrin or arsenic.

- In this plan we will refer to Annex 8 substances as chemicals.

**Chemical Status**

Chemical status is assessed from compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances. These are known as 'Annex 10' substances. We generally monitor for priority substances only in water bodies where there are known discharges of these pollutants. Water bodies without discharges of priority substances are reported as being at good chemical status.

**Annex 10 Substances** such as Tributyltin compounds, (Benzo(a)pyrene), and Nonylphenols.

- In this plan we will refer to Annex 10 substances as hazardous substances.

For further information on WFD classification methodology please see:

http://publications.environment-agency.gov.uk/PDF/GEHO0911BUEO-E-E.pdf

## Appendix 5: List of Environment Agency plans that are linked with the Water Framework Directive

| Acronym | Name of Plan | Description of Plan | National/ Regional/ Area | Timescale of Delivery | External Partners |
|---|---|---|---|---|---|
| Creating a better place | | Describes our corporate and other strategies, should effectively influence all work we do | National | 2010-2015 | |
| RBMP | Thames River Basin Management Plan | The plan describes the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment – the catchments, the estuaries and coasts, and the groundwater. | Regional | Reviewed every 6 Years | Defra |
| CAMS | Catchment Abstraction Management Strategy (CAMS) | Provides a licencing framework based on resource avalibility based on the relative balance between the environmental requirements for water and how much is licensed for abstraction. | Area | Originally 6 Year cycles, now reviewed every year | Water Companies (Thames Water, SE Water etc.) |
| SWMP | Surface Water Management Plan (SWMP) | SWMPs will underpin in taking the lead on managing flooding from surface runoff, as well as groundwater and ordinary watercourses where relevant. The plan includes an assessment of flood risk from these sources and a programme of actions to manage these risks. | Area | 2009 onwards | Defra |

| Acronym | Name of Plan | Description of Plan | National/ Regional/ Area | Timescale of Delivery | External Partners |
|---|---|---|---|---|---|
| CFMP | Catchment flood management plan (CFMP) - Thames Region | The Thames Region CFMP is a high-level strategic planning tool. It will be used to identify and agree policies for sustainable flood risk management when working with other organisations and decision-makers. It takes into account the likely impacts of climate change and future development across the region. | Regional | 50-100 years | |
| NaFRA | National Flood Risk Assessment (NaFRA) | NaFRA shows the likelihood of flooding across England and Wales and can be combined with property data to determine the economic damages from flooding, therefore giving us a picture of flood risk. It is one of the Environment Agency's key datasets. It works out the probability of flooding from rivers and the sea, considering the location, type and condition of defences and maps these on a 50m x 50m grid in three probability bandings | National | 2004-2011 annual updates, now updated by area FRM & DM teams | |
| CSF | Catchment Sensitive Farming (CSF) | Catchment Sensitive Farming is land management that helps to tackle agricultural diffuse pollution | Area | 2011 onwards | Defra, NFU, Natural England |
| SEF | Strategic Environmental Framework (SEF) | The aim of this document is to prioritise and target improvement in ecological status of the River Thames. This is primarily driven by the Water Framework Directive (WFD) and will be delivered through the Environment Agency's Capital Programme. | Area | 2010 onwards | |
| BAP | Biodiversity Action Plan (BAP) | The UK BAP describes the biological resources of the UK and provides detailed plans for conservation of these resources, at national and devolved levels. Action plans for the most threatened species and habitats have been set out to aid recovery, | National | Reporting rounds every 3 to 5 Years | Joint Nature Conservation Committee, Natural England |

| Acronym | Name of Plan | Description of Plan | National/ Regional/ Area | Timescale of Delivery | External Partners |
|---|---|---|---|---|---|
| NPPF | National Planning Policy Framework (NPPF) | The National Planning Policy Framework sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities. | National | | Local Authorities |
| SE Angling Participation Plan | | A plan aiming to increase levels of participation in Angling, promoting fishing in an environmentally responsible way. | Regional | 2011-2012 | County Angling Action Groups, Angling Development Board, Fishing clubs, fisheries, local authorities, NGOs |
| CFE | Campaign for the farmed environment (CFE) | The Campign for the Farmed Environment (CFE) is an industry led campaign to replace the environmental benefits of set aside (which ended in 2008). The objective is to retain and exceed the environmental benefits that used to be provided by set-aside. CFE have until 2012 to make this voluntary approach work, otherwise regulation will be put in place. | Regional | 1 Year | |
| Best Farming Practices | | Best Farming Practices explains how wise use of resources such as soil, nutrients, water and energy can help farmers to cut costs while maintaining or improving productivity. This is promoted on agricultural visits | Area | | |

| Acronym | Name of Plan | Description of Plan | National/ Regional/ Area | Timescale of Delivery | External Partners |
|---|---|---|---|---|---|
| CoGAP | Codes of Good Agricultural Practice (CoGAP) | The Code of Good Agricultural Practice is a practical guide to help farmers, growers and land managers protect the environment in which they operate. The Code describes key actions farmers can take to protect and enhance the quality of water, soil and air. It will help farmers to meet their legal obligations including those relating to cross compliance. | National | | Defra |
| Environmental Plan for Dairy Farming | | The Environmental Plan for Dairy Farming sets out a framework to improve environmental performance on dairy farms. The plan explains what these challenges mean for the industry and identifies ways that industry and government can work together to address them. It encourages dairy farmers to voluntarily take ownership of environmental issues and solutions, to improve environmental performance, and therefore reduce the need for further regulation. | National | | Dairy UK, NFU, mdc, RABDF |
| NVZ | Nitrate Vulnerable Zones | The Nitrate Pollution Prevention Regulations 2008 have been introduced to implement the European Communities Nitrates Directive and to reduce nitrogen losses from agriculture to water. They designate areas where nitrate pollution is a problem, known as Nitrate Vulnerable Zones (NVZs), and set rules for certain farming practices which must be followed within these zones. | Area | 2008-2012 | Defra |
| Regional Strategy for Agriculture | | Document outlining the regional agricultral strategy | Regional | | |

## Appendix 6: List of Externally Hosted documents which are relevant to the Water Framework Directive

| Acronym | Name of Plan | Owner Organisation | Contact | Description of Plan | Timescale of Delivery |
|---|---|---|---|---|---|
| ILD | Inspiring and Enabling Local Communities | FWAG SW (authored by Countryside and Community Research Institute) | Jenny Phelps<br><br>(Chris Short) | There are 8 key themes to the ILD model. The approach:<br>▪ looks to work within the lowest appropriate National and European administrative structure (i.e. parish or ward, town, county, district, region, country);<br>▪ clarifies which statutory and non-statutory partners have an interest in the area so that they can be involved and their strategic aims and objectives identified and delivered within that administrative area;<br>▪ seeks to deliver a wide range of strategic objectives within the defined area in order to maximise the wider landscape scale potential effective use of public funds;<br>▪ seeks to strongly support and value the role and knowledge of the farming community;<br>▪ promotes the use of facilitation through an independent third party to develop a local management<br>▪ group that acts as the collective discussion forum for the area, with clear lines of communication to those public agencies with legal responsibilities;<br>▪ incorporates the Parish Council (or other local government framework) into the communication structure of the local management group to ensure continuity beyond project timescales;<br>▪ provides a forum for all those within the defined area to take action and offer knowledge and resource to achieve multi objective delivery with an inclusive list of partners;<br>▪ identifies funding opportunities, particularly through the Rural Development Programme for England, (RDPE) and match funding through joined up partnership working. | |
| WCS | Waste Core Strategy | Gloucestershire County Council | Gary Kennison | The waste core strategy explains how the County Council and its partners will address the issue of planning for waste management in Gloucestershire in the period 2012 to 2027. | 2012-2027 |

| Acronym | Name of Plan | Owner Organisation | Contact | Description of Plan | Timescale of Delivery |
|---|---|---|---|---|---|
| SIDP | Strategic Infrastructure Delivery Plan | Gloucestershire County Council | Gary Kennison | SIDP is a strategic infrastructure delivery plan, process and programme. Its purpose is to co-ordinate and integrate the delivery of infrastructure required to serve new and existing development in Gloucestershire in the future; and in so doing, to provide a sound evidence base to underpin the Local Development Frameworks (LDFs) of the District Councils. | 2010-2026 |
| | Biodiversity Delivery Plan | Gloucestershire Biodiversity Partnerships | Gary Kennison | The Local Biodiversity Partnership has developed a 50 year vision for delivering a new County framework for biodiversity conservation through a focus on Strategic Nature Areas (SNAs) which go to make up the Gloucestershire Nature Map. SNAs provide a targeted approach to conserving biodiversity at a landscape-scale and also help us to adapt to climate change. The SNAs identify where the greatest opportunities for habitat restoration and creation lie, enabling the efficient delivery of resources to where they will have the greatest positive conservation impact. | 50 Years |
| (LGAP) | Gloucestershire Cotswolds Geodiversity Audit & Local Geodiversity Action Plan | Gloucestershire Geoconservation Trust | Gary Kennison | One of the main purposes of a Geodiversity Action Plan is to repair the imbalance between the biotic and abiotic in nature conservation policy and to raise awareness of the importance of geodiversity in the management of the environment. All geological features are vulnerable to a variety of factors, both man-made and natural, including man-made interference from development, landfill and fly-tipping, plus natural processes such as overgrowth of vegetation and natural erosion that would not be accepted at equivalent sites of biological or archaeological importance. This Geodiversity Action Plan aims to confront these threats and to develop management practices and sustainable mechanisms for developing, supporting and sustaining geodiversity. | |

| Acronym | Name of Plan | Owner Organisation | Contact | Description of Plan | Timescale of Delivery |
|---|---|---|---|---|---|
| CWP | Cotswold Water Park Master Plan | Gloucestershire County Council | Rob Niblett | The CWP Strategic Review and Implementation Plan (Master Plan) aims to produce a vision for the future of the area. The purpose of the study was to reflect the views of various sectors active within the Park, such as land owners, minerals operators, holiday parks and conservationists, and also the hopes and concerns of the 20,000 people who live within the Park's 40 square miles. | 20-25 Years |
| | Minerals Local Plan | Gloucestershire County Council | Rob Niblett | A plan devised which is used by local councils to guide planning decisions on minerals related developments | 9 Years |
| | The Cotswold Rivers Living Landscape Programme | Gloucestershire Wildlife Trust | Liz Parker | The Cotswold Rivers Living Landscape Programme aims to reconnect and restore healthy river habitats throughout the Cotswolds. | |
| | Cotswolds Area of Outstanding Natural Beauty Management Plan | Cotswolds AONB | Mark Connelly | The Cotswolds AONB Management Plan 2008-13 covers the wide range of issues that affect the area including; development and transport, rural land management, natural resources, biodiversity and the historic environment. The plan not only sets out the board's objectives, policies, actions and tasks for 2008-13 but also provides a vision for the future of the AONB over the next 25 years. It is not just a plan prepared by the board for itself but a plan for all those who value the area and have an interest in it. | 2008-2013, 2013-2018 |
| | Strategic Environmental Assessment of the Review of the Cotswolds AONB Management Plan | Cotswolds AONB | Mark Connelly | The Scoping Report is the first stage of the SEA of the Cotswold AONB Management Plan review process. The current Cotswold AONB Management Plan was adopted in 2008. | 2012-2013 |

**Further copies of this document are available from:**

**Area Environment Planning Team**
**Red Kite House**
**Howbery Park**
**Wallingford**
**OX10 8BD**

**thw.aept@environment-agency.gov.uk**
**www.environment-agency.gov.uk**